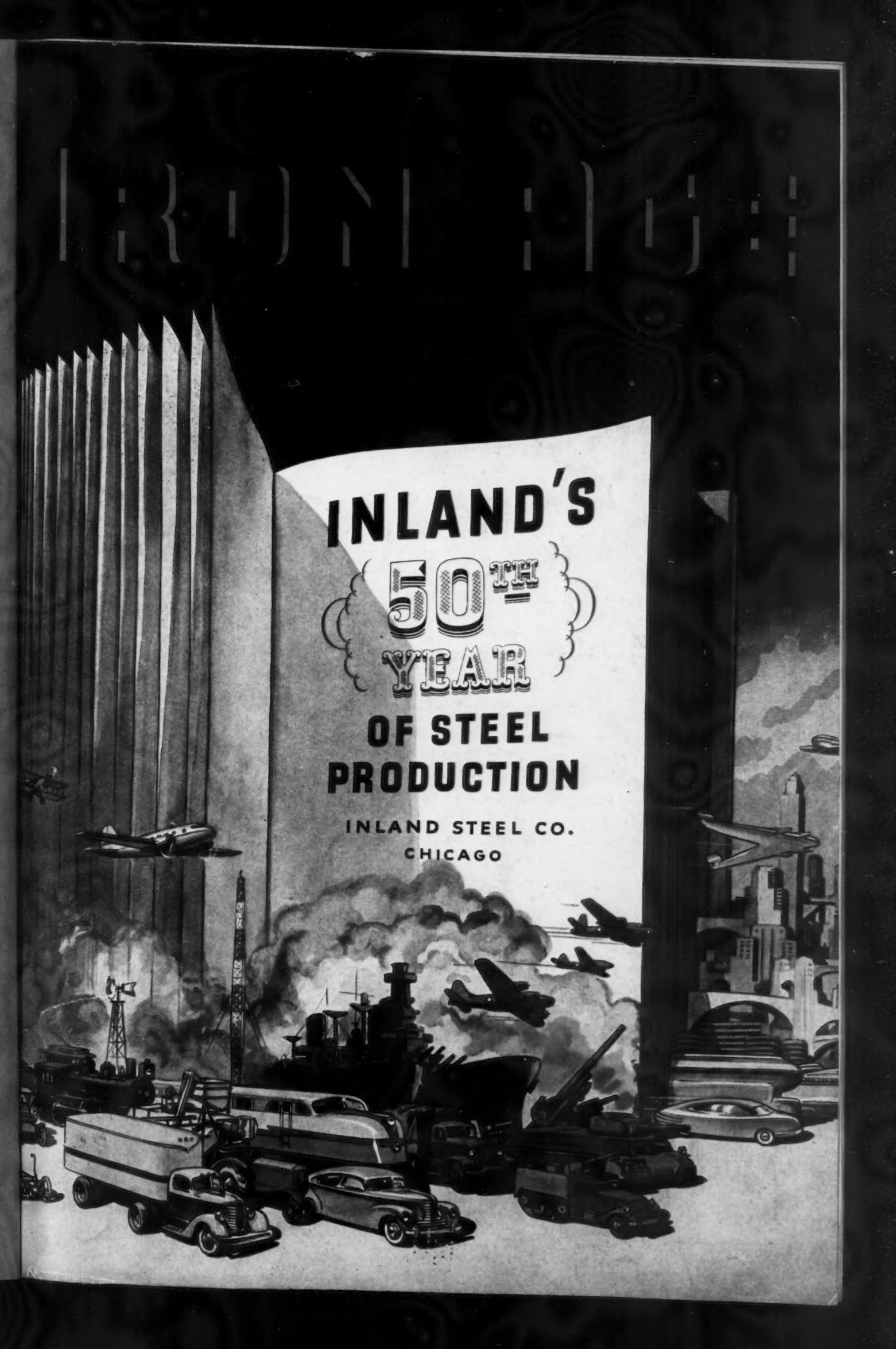
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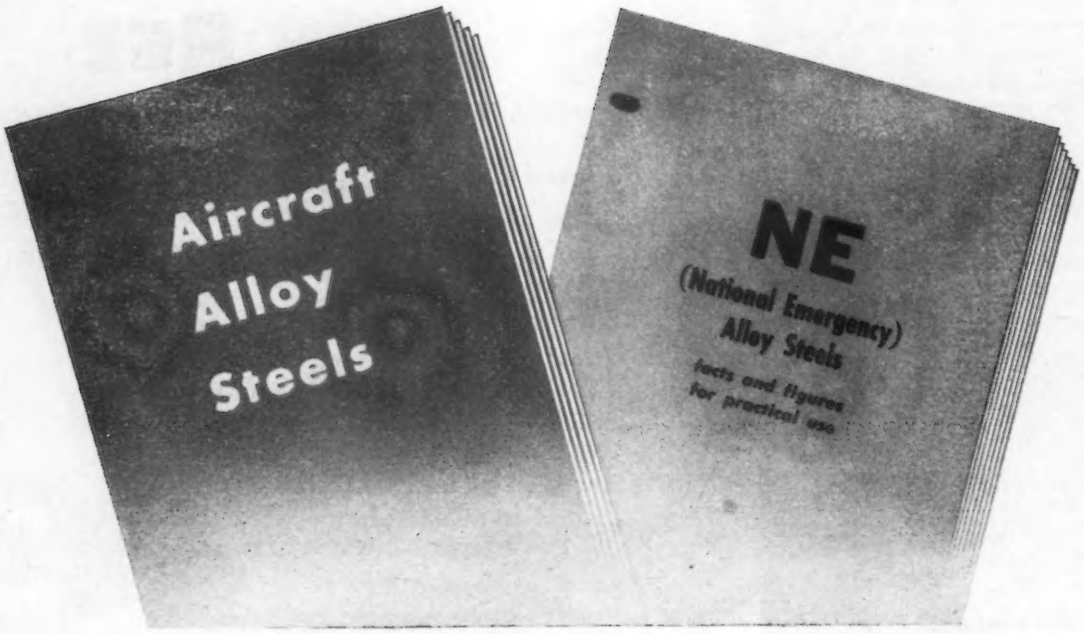

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Write for helpful booklets

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The
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ESTABLISHED 1855

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Taking the Cent from Incentive

THIS editorial is directed to you men and women in our industry who are paid on a commission basis and to you people who employ them. Smoke is coming from your houses and you had better grab the water buckets.

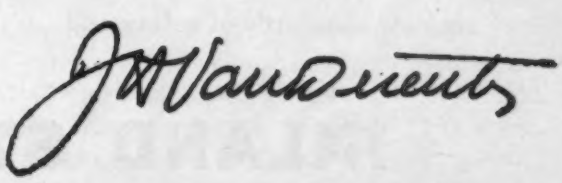
If you do not get busy and do something about it you may find yourself in a position where you will not be permitted to receive or to pay a commission compensation for 1943 that is greater than that received by or paid to the same individual in 1942 or 1941. Stabilizer Byrnes is reported to be working on that line and to be about to issue an order.

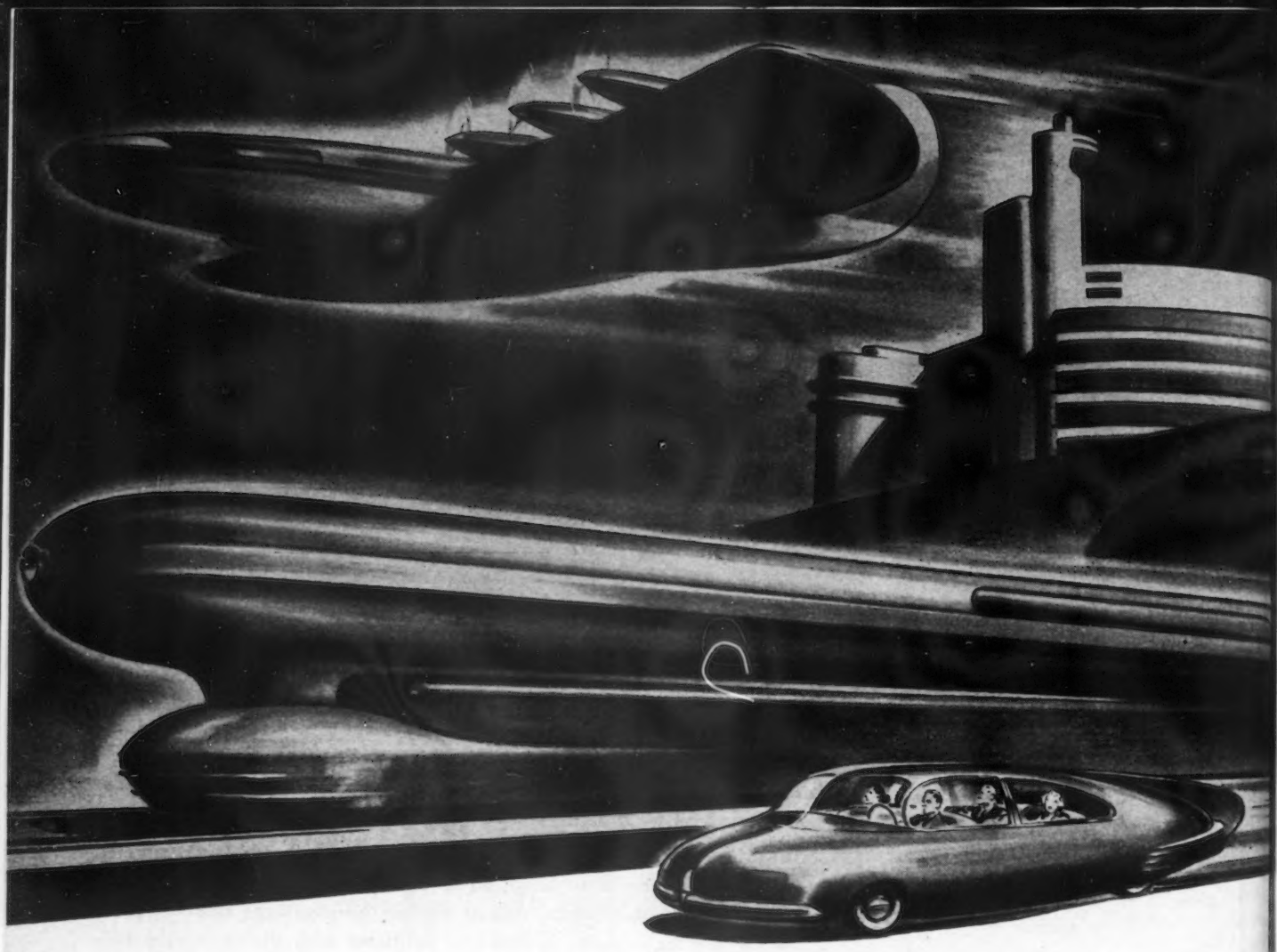
Stabilization is a fine-sounding and impressive word, but if the act of stabilization is carried to an extreme another less pleasant word fits the picture better. That word is strangulation. A strangled person is completely, finally and definitely stabilized forever. And the proposal to regulate commissions on a basis of past performance would pretty definitely strangle selling incentive and with it our hopes for maintaining post-war employment.

Object of the proposed new gadget for the already overgadgeted stabilizing machine is to keep down purchasing power. No one has as yet proposed the bright idea of cutting hourly wage rates or piece rates for the same purpose and any politician who did so would face an outraged constituency. Yet this proposal to "stabilize" commissions is similar in nature. It is not aimed at stabilizing the rate of commission but the total amount earned. Thus a salesman working on a 10 per cent rate who this year through working harder, longer or better boosted his sales volume 25 per cent would find his rate cut by the stabilizing mandate to 7½ per cent.

But this is not the half of it. Commissions are usually paid as earned, on a weekly, monthly or quarterly basis. In most cases the money earned has already been spent or invested in Government bonds. Thus a salesman or one in any commission-paying occupation who is unfortunate enough to be 25 per cent ahead of last year by Oct. 1 will either have to take a three months' vacation or else work during the last quarter for no pay. If he is doubly unfortunate in being 50 per cent ahead of the "base" year he will have to do either one of these two things and also pay back a quarter year's earnings to his company.

It is estimated that fully 80 per cent of our merchandising and service transactions are kept going by the commission idea in whole or in part. Now that we are on the threshold of releasing more and more materials to non-war products, it would be a silly and damaging thing to take the cent out of incentive. If you agree with me it would be well to let your congressman know how you feel about it.





Better Steels are Coming— from the Tests of War

Hour after hour, month after month, Inland metallurgists study not only the needs for this war of steel, but also the requirements of a victorious America—the America that will turn again to peacetime developments in the crafts, and in the sciences—new developments that will prove again that free peoples set the pace for others to follow. Coming out of the tests of war are finer steels—steels that will set new standards of safety and speed in transportation. Steels that will help bring the newest advancements in swift communications into most homes in the land. Steels that will bring new conceptions of beauty, convenience, comfort, and utility—all at prices that can be afforded by the average American. Yes, you can look forward to the day when steel from Inland, now flowing 100 per cent into war products, will help build a greater America.

INLAND STEEL COMPANY

38 S. Dearborn St., Chicago, Ill. • Sales Offices: Milwaukee, Detroit, St. Paul, St. Louis, Kansas City

The IRON AGE
OCT. 7, 1943

NEWS FRONT

• Government figures set current unemployment at 1,200,000. Generally accepted peacetime figure for "irreducible minimum of unemployables" was 3,000,000.

• The Bailey-Clark bill to restrict government office employment of able-bodied males of draft age will have little effect on civilians, most of the draft eligibles already having been caught in the Selective Service sieve. But apparently it will force the transfer of hundreds of young officers and enlisted men from War and Navy Department jobs to be replaced by older men.

• A coming executive order will transfer all foreign food operations to Leo T. Crowley. Most of the U.S. responsibility for war and post-war relief food will be carried out under foreign development with the U.S. giving not great quantities of free food, but (a) guaranteed markets at a fair price, (b) know-how, and (c) some farm machinery and seeds.

• Addresses of German steel plant engineers and executives, which used to be in the Ruhr, are now changing, in rapidly increasing numbers, to Prague and Vienna.

• Newest complaint against the USES referral (Buffalo) plan, now being extended to Detroit, is that since women will remain free agents, they will obtain the best jobs.

• Pointing up this grouse is the fact that during the past year, increase in employment in the Detroit area has been entirely due to hiring of women. Male employment figures, static for months, are now dropping slightly.

• Workers of Cleveland Automatic Machine Co. are being lend-leased to other manufacturers during a three months' Cleveland Automatic conversion program. They will retain full seniority, vacation rights, etc.

• Land mines, used in phenomenal profusion by the Germans, have accounted for far larger Allied losses in personnel and equipment than indicated by official communiqué. Pictures always show detection by bayonet probing, which is slow and dangerous, or by electrical means, which has been rendered useless by a recent German switch to wooden and plastic mine casings.

• Rapid opening of paths through mine fields, often some miles in depth, has become imperative. The British now use a large sectional tubular framework which can be pushed forward a hundred yards or so, plowing up the ground and setting off the mines. Americans have devised large rolls of canvas or wire netting to which are attached many small explosive charges. Powerful springs roll this canvas out some hundreds of feet, the charges are set off and the mines are exploded.

• Turkey, a neutral, has adopted a tax of unprecedented severity. It provides for a capital levy on wealth and excess profits of salaried private employes, important farmers, companies, business men and real estate owners, with forced labor for those not liquidating their tax within a month.

• A newly devised, sand impact-optical reflectivity method now making possible accurate hardness measurements of thin surface layers, will split many a hair on effect of surface preparation on surface hardness.

• Random studies at California Shipbuilding Corp. show that deep fillet welding, as compared with conventional welding, is making man-hour savings of 37 per cent on small bulkhead section jobs and 45 per cent on large interbottom sections, with a 25 per cent saving in electrodes on both jobs.

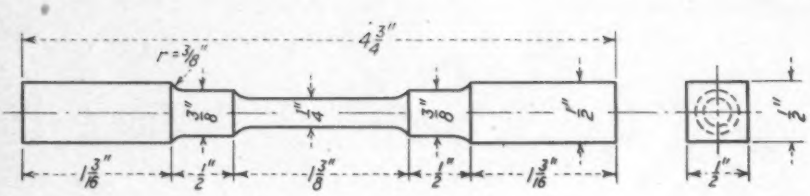
• In January the personnel gap between required and actual total personnel for the big eight West Coast airframe producers was approximately 1300. In June the gap had passed 19,000. But: during the first seven months of the year, a 44 per cent increase in production was achieved with only a 4 per cent increase in employment.

• Now an intensive house-to-house pressure worker recruiting campaign is planned in the San Francisco Bay area to avoid threatened cancellation of contracts. Women will be the principal quarry.

• Boeing "exit interviews" for first half of 1943 showed that 65 per cent of all resignations were women, three-fourths of which gave domestic and personal reasons for leaving. Elsewhere in the country women also continue to drift from war jobs back to the home.

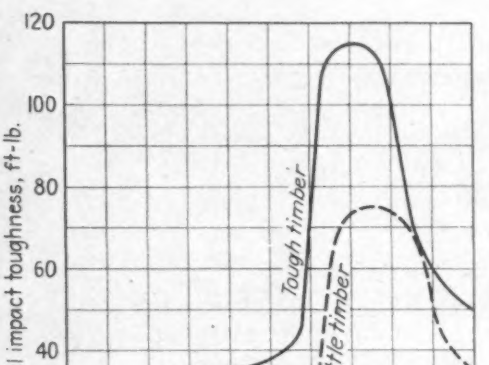
Heat Treatment Effect on the

Torsion Impact



ABOVE

FIG. 1—Standard specimen used for the torsional impact test. For specimens in Series A and B, the bars were cast to shape in a core, and 3/32 in. machined off over the entire bar. Specimens in Series C and R were machined from a 0.75-in. cast figure bar.



LEFT

FIG. 2—Comparative toughness of tough and brittle carbon tool steels, brine quenched from 1450 deg. F. Note the indication of toughness on tempering at such low temperatures as 300 to 400 deg. F., which has little or no effect on the hardness of such steels.

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THE torsion impact method of testing has been valuable in studies on toughness of carbon tool steels, where the torsion strength has been shown to vary within wide limits on both tough and brittle steels, and where Izod or Charpy values showed little change as a result of varying the tempering temperature.

The object of the investigation described here is to determine the effect of tempering, after oil quenching from 1550 deg. F., on the torsional impact strength of Meehanite metals.

The test samples, as shown in Table I, were prepared and heat treated at General Iron Works, Denver. The torsional impact tests were conducted by the authors at State College, Pennsylvania.

In all cases the metal was tapped from the cupola at 2830 deg. F. and the bars were poured hot, but no actual measurements were taken of the pouring temperature.

In Series A and B, the bars were cast to shape in a core and poured on end, through a ¼-in. gate. The finish left on the bars was 3/32 in., and this amount was machined off over the entire bar.

With Series C and R, the bars were machined from a 0.75-in. cast figure bar, cast in a core and poured on end through a 5/16-in. gate.

The standard specimen used for the torsional impact test is illustrated in Fig. 1. The testing machine, a standard model of the Carpenter torsion impact machine, was so calibrated that the "striking energy" was equal to $(R.P.M.)^2 \times 0.000492$, and the "remaining energy" equal to $(R.P.M.)^2 \times 0.000494$.

Data on carbon tool steels, showing the difference between tough and brittle steels, are illustrated in Fig. 2. The important feature is the indication of toughness on tempering at such low temperatures as 300 to 400 deg. F., which has little or no effect on the hardness of such steels. The torsion impact values should also be compared with the approximate data for Izod values on the same steels.

Data on a carbon tool steel containing small amounts of silicon and mo-

TABLE I

Samples Used in Testing Effect of Heat Treatment on Torsion Impact Properties of Meehanite

Type of Meehanite used:	"GM" (Alloyed)	"GM" (Alloyed)	"GA"	"GA"
Sample marked:	Series A	Series R	Series B	Series C
Diameter of cupola, in.:	42	54	42	54

TABLE II

Torque in Terms of Ft.-Lb. of Energy Absorbed Meehanite

Drawing Temperature, Deg. F.	Series A (Alloyed)	Series R (Alloyed)	Series B (Unalloyed)	Series C (Unalloyed)
	"GM"	"GM"	"GA"	"GA"
"As cast"	11.7	9.2	15.4	15.1
400	4.8	6.0	6.3	1.8
530	1.5	4.1	7.1	2.7
730	3.2	2.8	7.3	2.7
830	4.0	5.4	6.9	10.2
1000	3.3	5.6	11.3	6.7
1100	4.0	4.6	9.2	5.6
1200	7.3	9.1	10.0	5.4

Properties of Meehanite . . .

By C. R. AUSTIN and
M. M. LIPNICK,
Pennsylvania State College,
State College, Pa.

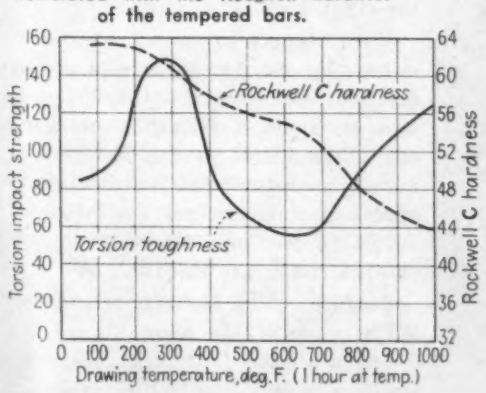
lybdenum are given in Fig. 3. The graph shows the effect of tempering up to 1000 deg. F. and correlates the torsional impact strength with the Rockwell hardness of the tempered bars.

After preheating to 1550 deg. F., the test bars were quenched in oil and withdrawn smoking at 300 deg. F. The bars were then tempered for 15 min. at various temperatures, ranging from 400 deg. to 1200 deg. F. The exact tempering temperatures are recorded with the data obtained from the torsion impact tests, as shown in Table II.

The results from series "GM" and "GA" show, comparatively, the effects of tempering on alloyed and unalloyed Meehanite, when cast as oversize test bars (Series A and B) and when cast as straight ¾-in. diameter bars (Series C and R).

Plots of these data on the comparison basis thus drawn are included to permit ready analysis of the results. Values of Brinell hardness have also been added to the chart in Fig. 4. The plotted data for Series C and R are included in Fig. 5.

FIG. 3—Effect of tempering up to 1000 deg. on a carbon tool steel containing small amounts of silicon and molybdenum. Torsional impact strength is correlated with the Rockwell hardness of the tempered bars.



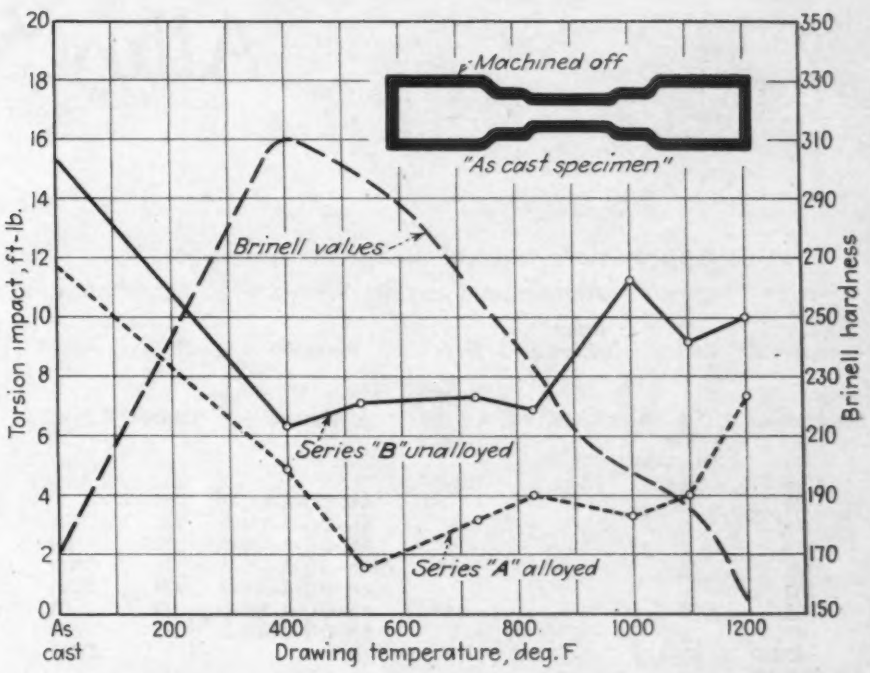
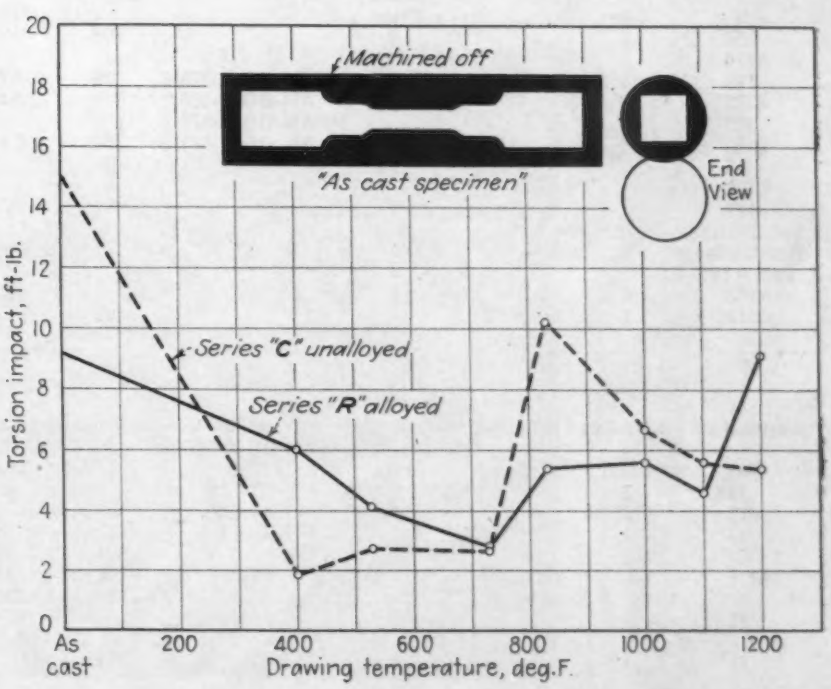


FIG. 4—Effects of tempering on torsion impact and Brinell hardness properties of alloyed and unalloyed Meehanite, when cast as oversize test bars (Series A and B).

FIG. 5—Effects of tempering on torsion impact and Brinell hardness properties of alloyed and unalloyed Meehanite, when cast as straight ¾-in. diam. bars (Series C and R).



Aluminum Casting Alloy Substitution

Approximate Equivalent Specifications for Aluminum Casting Alloys

Commercial	Federal	Army Ordnance	Navy	Aeronautical	SAE	ASTM
Sand Castings						
Specification	QQ-A-601 and E-QQ-A-601	AXS 784	46-A-1 (INT) (5-1-42)	Number	Number	B 26-42 T
Alloy	Class	Class	Class			Alloy
220	..	..	..	AN-QQ-A-392-2	324	....
356	3	..	3	AN-QQ-A-394-2	323	SG1
214	5	..	5	AN-QQ-A-402-2	320	G1
142	6	..	..	AN-QQ-A-379-2	39	CN21
355	10	..	..	AN-QQ-A-376-2	322	SC21
195	4	..	4	AN-QQ-A-390-2	38	C1
43	2	..	2	AN-QQ-A-405-3	35	S2
40E	..	..	1	..	..	ZG41
Sec. 355 and Modifications	..	..	..	..	..	....
Sec. 195	13	13	4a	AN-A-5	E-325	C2
X113-A334 and Modifications	14	14	..	AN-A-4	E-326	....
108	8	..	..	AN-QQ-A-397-2	..	....
212	9	..	..	AN-QQ-A-399-2	36	CS21
112	..	15	..	..	33	....
12	..	15	..	..	33	CS22
Permanent Mold Castings						
Specification	QQ-A-596	..	46-A-15 (INT) (2-1-42)	Number	Number	B 108-41T
Alloy	Class	..	Class			Alloy
356	8	..	8	..	323	SG1
A214	..	..	..	..	..	....
142	3	..	3	AN-QQ-A-379-2	39	CN21
A132	9	..	9	AN-QQ-A-386-2	321	SN41
355	6	..	..	AN-QQ-A-376-2	322	....
B195	4	..	..	AN-QQ-A-383-2	380	CS4
43	7	..	7	..	35	S2
C132	..	..	..	..	..	....
122	2	..	2	..	34	CG1
Sec. 355 and Modifications	..	..	6	..	..	....
Sec. B 195	..	..	4	..	..	....
A108	5	..	5	..	..	SC1
C113	1	..	1	..	33	C3
Die Castings						
Specification	QQ-A-591	Number	46-A-14 (INT) (2-1-42)	Number AN-QQ-A-366-4	Number	B 85-42 & EA-B85
Alloy	Class		Class	Class		Alloy
13X	2	..	2	A1-13X	..	....
218	7	..	7	A1-218	..	....
13	1	..	1	A1-13	305	V
43	3	..	3	..	304	IV
A379	10	AXS 679 (Rev. 3)	..	A1-85X	E306	LXXIX-B
			..	..	E308	LXXIX-A
85	5	..	5	A1-85	307	VII-A
..	..	..	..	..	..	VII-B
81	4	..	4	..	312	XII

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TO help improve the situation in aluminum casting alloy materials, WPB's Conservation Division has recently issued a substitution chart and a table of approximate equivalent specifications.

This chart divides into four groups, according to the percentage of primary ingot or scrap aluminum specified, the standard aluminum alloy specifications used in sand, permanent mold and die castings.

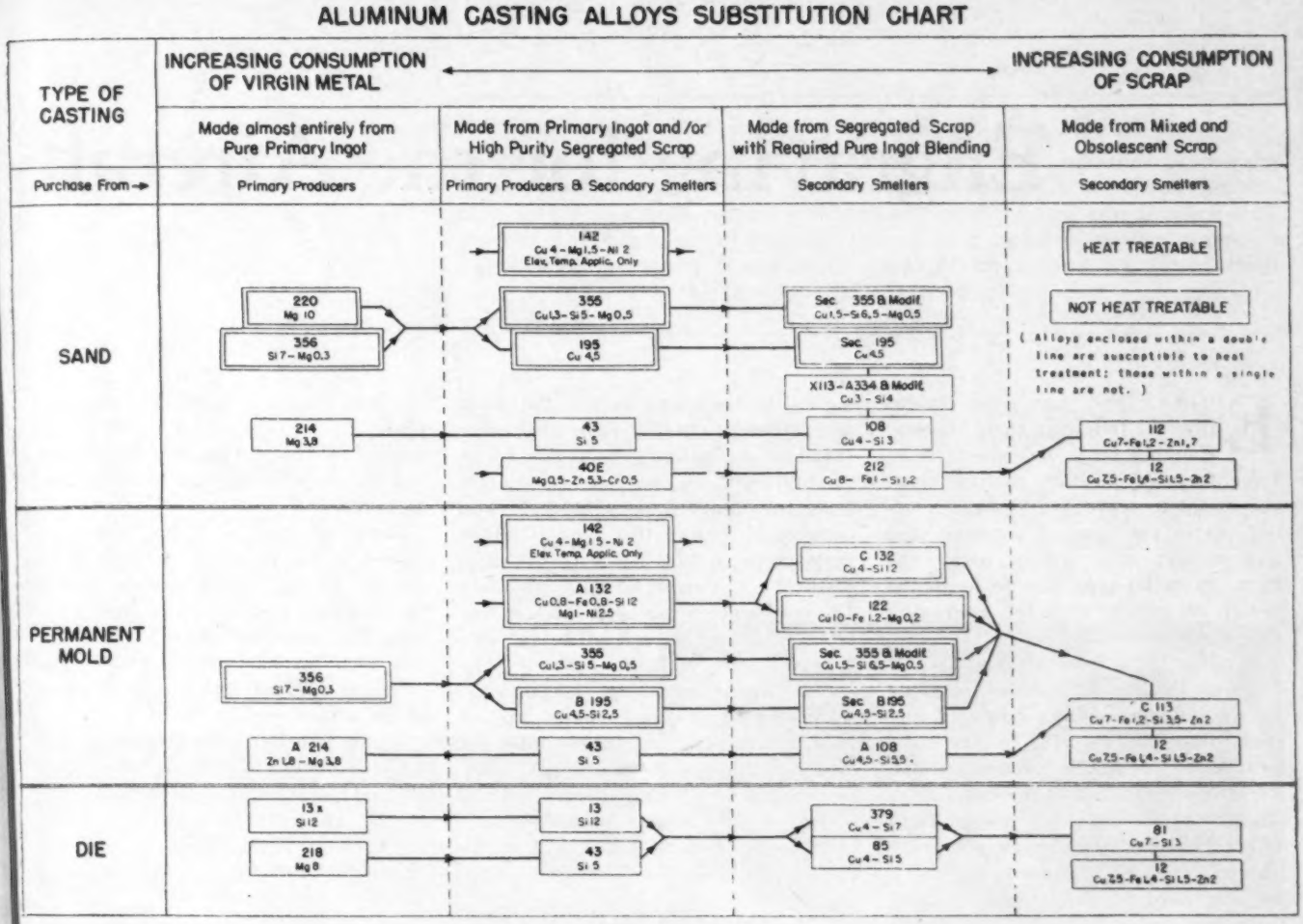
As will be noted, specifications containing the highest purity ingot are at the left, grading to those with the most scrap on the right. The accompanying table of equivalent specification tables translates the commercial specifications into the approximate equivalent government and engineering society specifications.

In using this chart, two things should be remembered. First, if a satisfactory, less critical substitute material in some other field can be used, even the lower grades of aluminum should be avoided. Second, if high mechanical properties, specific physical properties, maximum resistance to corrosion or particular casting characteristics inherent in an alloy toward the left of the chart are not essential, it is a contribution to the war effort to use an alloy nearer the right.

With respect to special characteristics alloy No. 142 occupies a unique position. Because of its nickel content, it is not a desirable substitute for other alloys, while for certain high temperature uses suitable alternate materials are not available. It should be used only where its unique characteristics are essential.

Because of directives issued by WPB, some of the alloys in column 2 are available from the secondary smelters in only limited quantities.

ALUMINUM CASTING ALLOYS SUBSTITUTION CHART

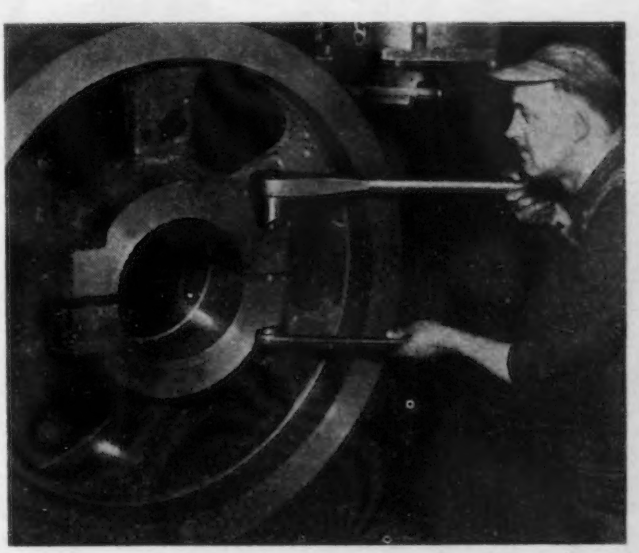

TYPE OF CASTING
INCREASING CONSUMPTION OF VIRGIN METAL
INCREASING CONSUMPTION OF SCRAP
Made almost entirely from Pure Primary Ingot
Made from Primary Ingot and /or High Purity Segregated Scrap
Made from Segregated Scrap with Required Pure Ingot Blending
Made from Mixed and Obsolescent Scrap
Purchase From →
Primary Producers
Primary Producers & Secondary Smelters
Secondary Smelters
Secondary Smelters
SAND
PERMANENT MOLD
DIE
HEAT TREATABLE
NOT HEAT TREATABLE
(Alloys enclosed within a double line are susceptible to heat treatment; those within a single line are not.)
142 Cu 4 - Mg 1.5 - Ni 2 Elev. Temp. Applic. Only
220 Mg 10
356 Si 7 - Mg 0.3
355 Cu 1.3 - Si 5 - Mg 0.5
195 Cu 4.5
Sec. 355 & Modif. Cu 1.5 - Si 6.5 - Mg 0.5
Sec. 195 Cu 4.5
X113 - A 334 & Modif. Cu 3 - Si 4
214 Mg 3.8
43 Si 5
108 Cu 4 - Si 3
112 Cu 7 - Fe 1.2 - Zn 1.7
40E Mg 0.5 - Zn 5.3 - Cr 0.5
212 Cu 8 - Fe 1 - Si 1.2
12 Cu 2.5 - Fe 1.4 - Si 1.5 - Zn 2
142 Cu 4 - Mg 1.5 - Ni 2 Elev. Temp. Applic. Only
C 132 Cu 4 - Si 12
A 132 Cu 0.8 - Fe 0.8 - Si 12 Mg 1 - Ni 2.5
122 Cu 10 - Fe 1.2 - Mg 0.2
356 Si 7 - Mg 0.3
355 Cu 1.3 - Si 5 - Mg 0.5
Sec. 355 & Modif. Cu 1.5 - Si 6.5 - Mg 0.5
B 195 Cu 4.5 - Si 2.5
Sec. B 195 Cu 4.5 - Si 2.5
C 113 Cu 7 - Fe 1.2 - Si 3.5 - Zn 2
A 214 Zn 1.8 - Mg 3.8
43 Si 5
A 108 Cu 4.5 - Si 3.5
12 Cu 2.5 - Fe 1.4 - Si 1.5 - Zn 2
13 x Si 12
218 Mg 8
13 Si 12
43 Si 5
379 Cu 4 - Si 7
85 Cu 4 - Si 5
81 Cu 7 - Si 3
12 Cu 2.5 - Fe 1.4 - Si 1.5 - Zn 2

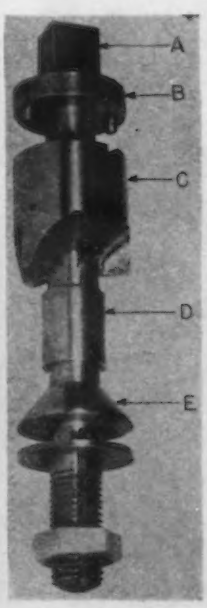
Special Spot-Facing Tool for Hub Nut Seats

A SPECIAL hand-operated spot-facing tool developed by J. De Fillippo, a workman at General Electric's Schenectady Works, overcomes difficulties encountered in securing a smooth seat for nuts and bolts on split hubs of rotor spiders. Using the spot-facing tool is slightly more expensive than the chipping method formerly employed, but it does a superior job. Chipping left a rough surface no matter how carefully it was done.

The holes in the hub are inaccessible with ordinary spot-facing tools. The tool devised by De Fillippo is built up on a shaft slightly smaller than the hole through the hub. As shown in the detail view, the shaft is turned from 2½-in. bar stock. End *A* is made 1 in. square for 1½ in., where a ½-in. plate *B* fitted with two ¼-in. pins is left. The balance of the shaft is turned 1 in. in diameter and threaded on the end. Next, a 2¼x2½ in. cutter *C*, slotted on top for the ¼-in. pins, is slipped onto the shaft and the shaft thus assembled is slipped through the hole in the hub. Then a bearing sleeve *D* to fit the shaft and the inside diameter of the hole is put in place, followed by a bearing cone *E*. The threaded end of the shaft is slotted with a keyway to hold a washer and a nut in place, thus completing the assembly.

Motive force is applied with a ratchet on the square end of the shaft while the cutter is fed into the seat by means of the cone, washer and nut. When one surface has been spot-faced, the assembly is reversed to finish the opposite seat.





Engraving for the Aircraft

ENGRAVING may be divided into the following three classes: Copying on to flat sheets from some form of master; cutting away the metal to leave the design in relief, as in the case of punches, dies and molds; and cutting away the metal by roller-type dies to leave the design in relief, used for engraving rules, plastic molds, etc.

In Fig. 2 is seen a model CXL Taylor, Taylor & Hobson machine set up for engraving a batch of aircraft indicator dials. To facilitate location a V guide is clamped to the worktable. Secured to the copyholder situated at the rear is a master copy (Fig. 1) with the design cut into plastic sheet; this is carefully drawn and engraved by hand to provide the necessary reduction. If the batch had been larger a brass master copy would have been used to eliminate the effects of wear caused by the stylus as it moves around the design.

For very large quantities steel would be employed. When making the master copy, care must be taken to observe the drawing limits which, for dividing, may be within 2½ min. of arc; the depths of graduations and figures can be controlled to within 0.001 in. In this particular example, to allow for luminous filling, the depth of the engraving is 0.012 in.

The CXL engraving machine is designed for handling larger flat work and bulkier articles than the other standard models of the range. The pantograph can be set to reduce from an enlarged copy at any ratio between 2 : 1 and 16 : 1 or, if necessary, down to 30 : 1. With the ratio set at 2 : 1, a circle of approximately 4¾ in. diameter can be covered at one setting. This feature of being able to cover such a large area is very useful when engraving lengthy inscriptions from copy made up of loose characters, as in the case of larger instrument dials. Another feature is the long vertical slide which provides a maximum clearance of 14 in. between the cutter and worktable. The swan-neck design of this machine makes it possible to engrave plates up to 19½ in. in width at one setting on the worktable. By reversing the plate, widths up to 33 in. may be handled.

Drive is from a ¼-hp. motor attached to the pedestal, the belt being carried to the cutter spindle behind the machine and therefore well away from the operator. This same motor can also be used to drive a cutter grinding machine which may be fitted as an attachment.

When first securing the work and master on their respective tables they are set so that the centers of the work, cutter, master copy and stylus coincide. The latter has a conical point to enable it to be guided around the engraved design and the cutter is tapered at a suitable angle according to the drawing requirements.

A slightly different type of work is seen in Fig. 4. These are plain graduated duralumin rings, approximately 8¾ in. outside diameter; one is divided to indicate every 5 deg. of arc and the other every 6 deg. The rings are too large to allow the use of an enlarged master copy, so the work is held flat on a circular dividing table fitted with a catch plate

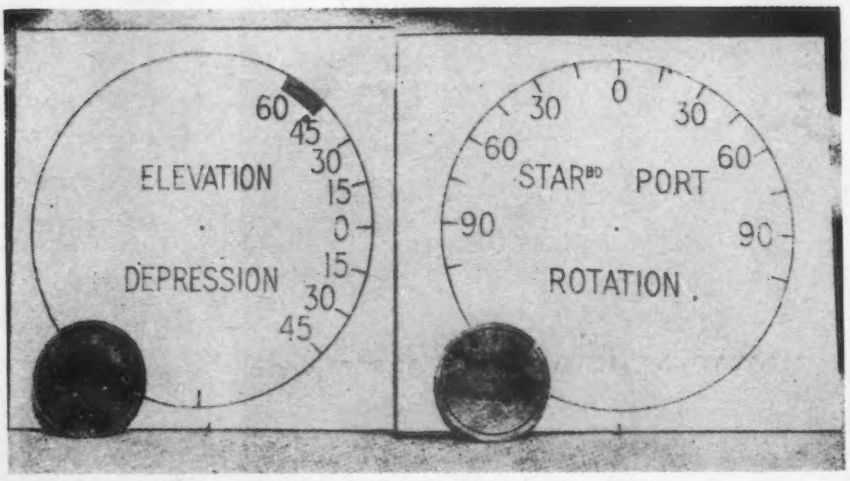
RIGHT

FIG. 2—A pantograph machine with a plastic master copy set up for engraving aircraft dials.

o o o

BELOW

FIG. 1—Two plastic sheet master copies, together with the dials engraved from them.



Industry

***In addition to firms engaged in the actual production of airframes, engines and other major accessories, there are a number which do not contribute directly to plane production, yet are vitally important to the industry. Among these specialized firms are those which do various types of engraving. Here is a review of the methods carried on by John Meerloo & Sons, as described by the British magazine* Aircraft Production.**

having 360 accurately spaced teeth. For special graduations the standard catch plate can be replaced by one having a different arrangement of teeth. For cases where exceptionally accurate spacing is necessary the firm has devised a removable vernier for attachment to the circular table.

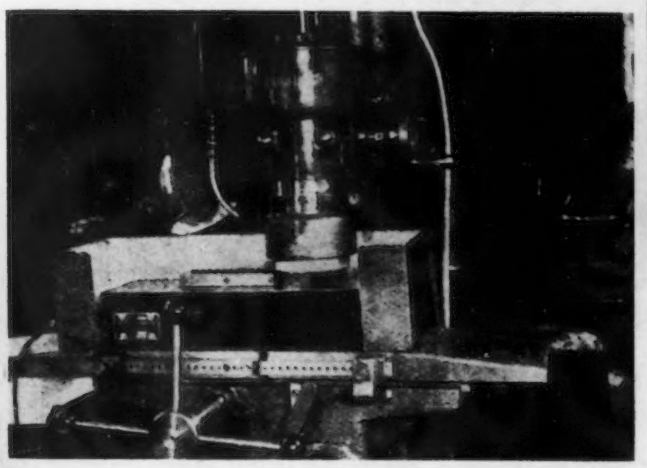
For this work the pantograph mechanism is locked and the table fed against stops to ensure graduations of equal length. When these are completed, sunk figures are secured on the copyholder and, via the pantograph mechanism, their profile transferred to the rings.

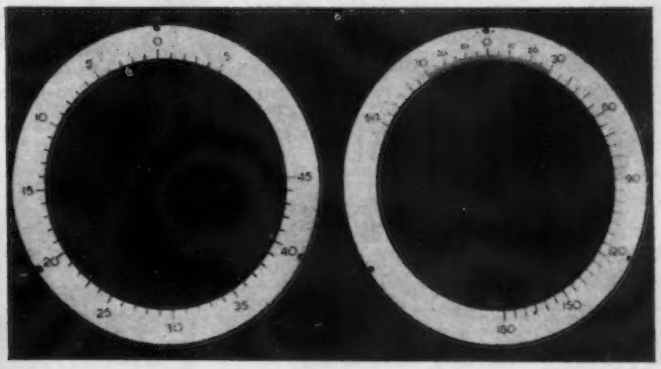
Three examples of roller-type marking dies are given in Fig. 5, and a machine is seen set up for this work in Fig 6. This time the metal is cut away to leave the graduations and figures in relief, and great care is necessary both when setting up and engraving to ensure that the tops —that is, the marking faces—are all identical.

The blank is held on a mandrel projecting from the center of a vertically arranged dividing table, and here particular care is necessary to ensure that the work circumference rotates truly, as lack of concentricity would result in graduations of different depth on opposite sides of the die. A careful choice of cutter must be made to ensure that knife-edge tops are left on the inscription.

As before, the graduations are cut by locking the pantograph mechanism and feeding the table against stops; indexing is achieved from the teeth of the catch plate at the rear of the circular table (Fig. 6). When the graduations are completed the figures are cut in the normal manner from relief masters secured to the copyholder, the stylus moving around the profile.

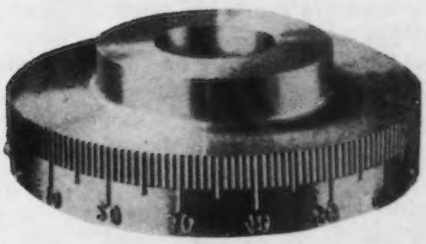
FIG. 3—Surface grinding the backs of interchangeable stamps to ensure even marking when in use.





UPPER RIGHT

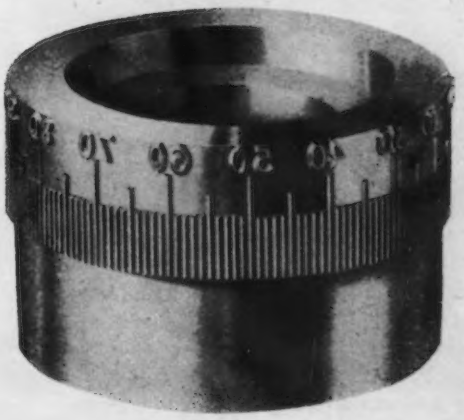
FIG. 4—Flat ring-type dials which are graduated with the aid of an indexing table.



o o o

RIGHT

FIG. 5—Roller-type dies with the metal cut away to leave the design in relief.



o o o

The finished die is hardened and then ground wherever necessary.

Another activity of John Meerloo & Sons is the manufacture of interchangeable steel stamps, an example of which is seen in the center of Fig. 7. The stamp blanks enter the shop as ground bar and are cut into suitable lengths on a milling machine, a few thousandths of an inch being allowed for subsequent grinding. These are placed singly in a vice on the machine table and engraved with the requisite letter or number from a relief master in the usual manner. Because of the radius of the cutter it is necessary to clean out all sharp corners by hand, an intricate piece of work when dealing with the smaller letters which may be only 1/16 in. high.

After hardening and polishing, the stamps are located inscription downward in a jig provided with slots into which they accurately fit. The assembly is placed on a magnetic chuck and the base of the stamps ground to a standard height from the letter face (Fig. 3) to ensure even marking when placed in the holder.

Fixed stamps incorporating one or more words are made by engraving directly on the machined face of a suitable forged shank. Another type of die, for embossing sheet steel on a 750-ton press, may also be seen in Fig. 7. It is in two pieces, one with the letters in relief and the other with sunk letters. In this case allowance for the thickness of the metal to be embossed is made on the sunk die.

Considerable importance attaches to the correct grinding of the cutter, and for this purpose a Taylor-Hobson type D machine, designed specially for grinding standard engraving machine cutters, has been installed. Even in the hands of quite unskilled operators first-class results are obtainable with this equipment. By the use of a range of clearance cams clamped on the end of the cutter socket, in conjunction with a cutter setting gage, the amount of clearance needed can be predetermined and repeated throughout the life of the cutter. The rest on which the cutter is held swivels and can be set to any angle, although it is marked only with the settings most commonly used, that is 10, 20, 30 45, 60 and 90 deg. In addition to the ordinary conical cutters, cutters with parallel sizes can also be ground to fine limits.

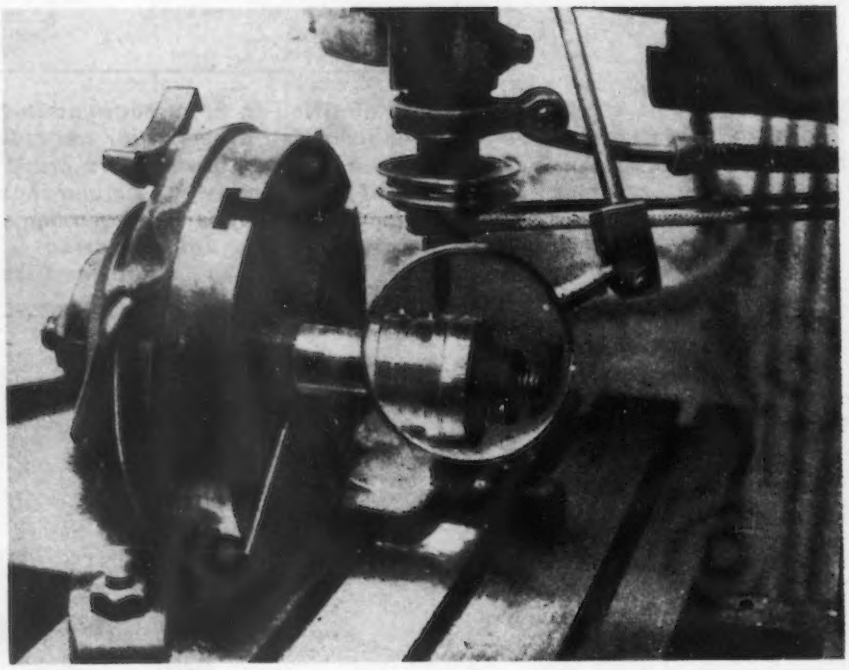


FIG. 6—Engraving a roller-type die. For small work of this nature a magnifying glass is used to assist the operator.

FIG. 7—Examples of Meerloo engraving. In the center is an interchangeable stamp and holder.

Effect of Forging on Bending-Fatigue Strength

THE effect of the degree of reduction by forging on the fatigue strength of specimens cut in the longitudinal and transverse directions from a bar of forged and heat treated steel containing C 0.32, Cr 0.2, and Ni 1.00, is reported by H. Krainer in *Archiv für das Eisenhüttenwesen*, June, 1942. The results are compared with those given in the literature for a chromium-manganese-molybdenum-vanadium steel and a chromium-nickel-molybdenum steel. With specimens cut in the longitudinal direction, the ratio of fatigue strength to tensile strength of both smooth and notched specimens decreases with increasing reduction by forging, and the notch sensitivity increases. With specimens cut in the transverse direction, the above ratio also decreases with increasing reduction, but in this case the reduction does not appear to affect the notch sensitivity. The ratio of the fatigue strength in the transverse direction to that in the longitudinal direction of both smooth and notched specimens decreases with increasing reduction, and the fall in the value of this ratio is greater for smooth specimens than it is for notched ones.

Automatic Helium-Shielded Arc Welding

THE development of both automatic and arc manual welding equipment specifically designed for the welding of magnesium, magnesium alloys, aluminum and other high-strength light alloys under a protective shield of helium gas, has been announced by General Electric Co. The availability of such equipment should make possible the greatly extended use in war production of the lighter metals whose welding demands precise control of concentrated heat and protection of the molten metal from the oxidizing effect of oxygen in the air.

The development of the new equipment is based on research work initiated some time ago at General Electric's welding laboratory and intensified recently in view of the development and wider use of the light alloy metals for war production. The basis of this research was the pioneering work done years ago by G-E engineers, H. M. Hobart and P. K. Devers, who discovered that fusion welding could be done in atmospheres of helium and argon using tungsten and carbon electrodes.

A hint of things to come in the arc welding of magnesium and other hard-to-weld metals is given by an automatic unit, Fig. 1, now in use at the G-E welding laboratory. Completely automatic, this equipment makes a smooth, clean weld, Fig. 2, under a shield of helium gas at rates up to 40 in. per min. on ⅛-in. stock, for example. Fig. 3 shows a close-up view of the welding of magnesium plate.

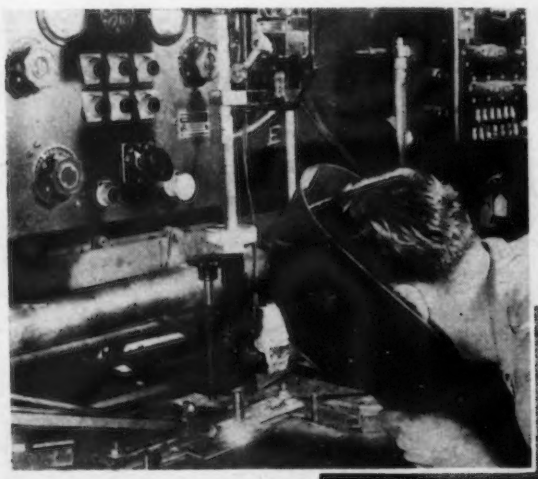
Substantially the same as a G-E unit now installed at the plant of a large producer of magnesium, this machine incorporates a new electronic motor control which enables the equipment to hold the proper arc length even while the arc climbs and descends inclines, such as encountered in welding curved surface parts.

Referring to Fig. 1, the filler metal (magnesium, here) is unreeled into the work at the correct angle through the small nozzle rod at the lower left. The tungsten electrode used to start and maintain the arc extends through the center of the rod perpendicular to the work and the helium gas is fed in around the electrode.

The rate at which filler metal is fed can be adjusted to a uniform feed into the arc, or a supplementary control can be used to feed wire into the arc, withdraw it, and then feed it in again—all on a predetermined cycle.

The heart of the manual helium-shielded arc welding equipment is a specially designed electrode holder which is arranged to hold either a tungsten or a carbon electrode and to surround the electrode with a stream of helium gas. The source of d.c. power for both manual and automatic welding is a standard G-E d.c. arc welding machine.

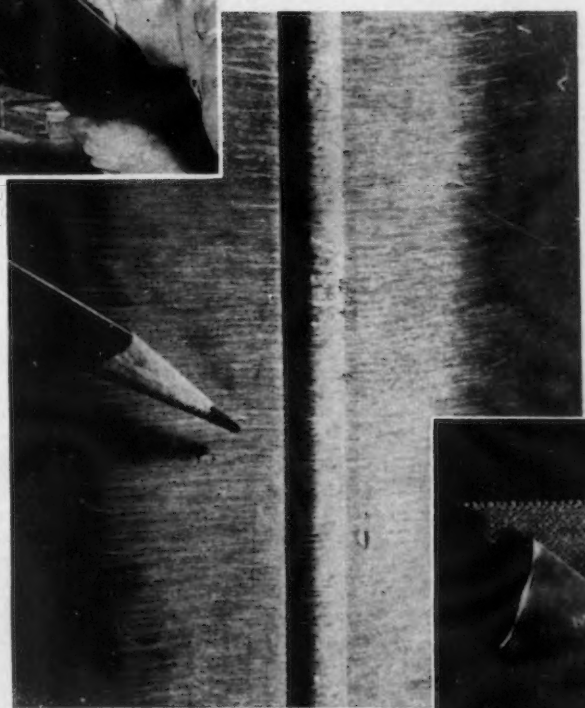
o o o



BELOW

FIG. 2—Butt-joint in ⅛-in. magnesium plate automatically welded at rate of 24 in. per min. with G-E helium-shielded arc welding equipment.

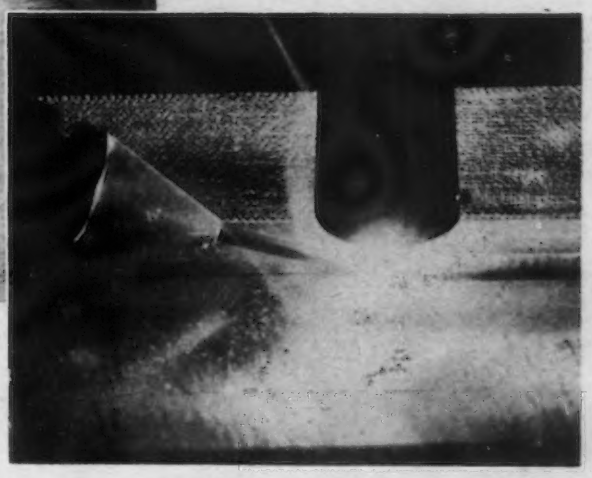
o o o



ABOVE

FIG. 1—Automatic helium-shielded arc welding equipment in operation. Electronic control panel at right controls arc length. Slanting tube (lower left) directs filler wire into the arc. All operations are controlled at panel at upper left. Tungsten electrode and gas nozzle are carried by the rod perpendicular to the work.

o o o



RIGHT

FIG. 3—Close-up view of welding of magnesium plate. Extremely accurate control of the rate of feeding the filler wire into the arc zone (through tube at left) produces the uniform bead contour shown at the right. The nozzle just above the arc surrounds the molten metal with a helium gas envelope.

Production Short Cuts

LEFT

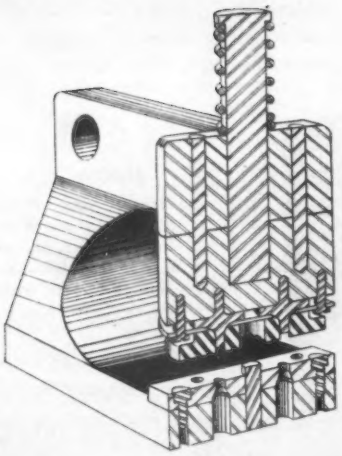
TWO relatively slow drilling operations are replaced with one rapid, punching action, by use of the plate nut punch shown and illustrated diagrammatically. The punch was designed for use in a standard Chicago pneumatic No. 214 rivet squeezer to punch the No. 40 rivet holes for stainless steel plate nut installations. Since the No. 214 squeezer exerts 3000 lb. force for 3/32 in. of the stroke, a pressure of approximately 120,000 lb. per sq. in. is applied by this punch. The stripping action is performed by two resilient rubber washers. The company estimates that the resulting reduction of time required and elimination of broken drills and burring operations will save approximately $500,000 a year.

o o o

BELOW

THIS rivet gage saves time in sorting mixed rivets, filling orders and checking incoming stock, and when used on the assembly line prevents use of wrong sized rivets. Rivet lengths from 4/16 in. to 20/16 in. are measured across the width on one side of the gage. On the reverse side, rivets from 20/16 in. to 40/16 in. in length are measured from the top of the gage down. For determining the diameter of the rivets, holes running in 1/32 in. steps from 3/32 in. through 8/32 in., each hole being 0.002 in. oversize, are at the bottom of the gage. The 1/8 in. unmarked hole is a key ring hole. The gage is made of 18 gage cold rolled steel.

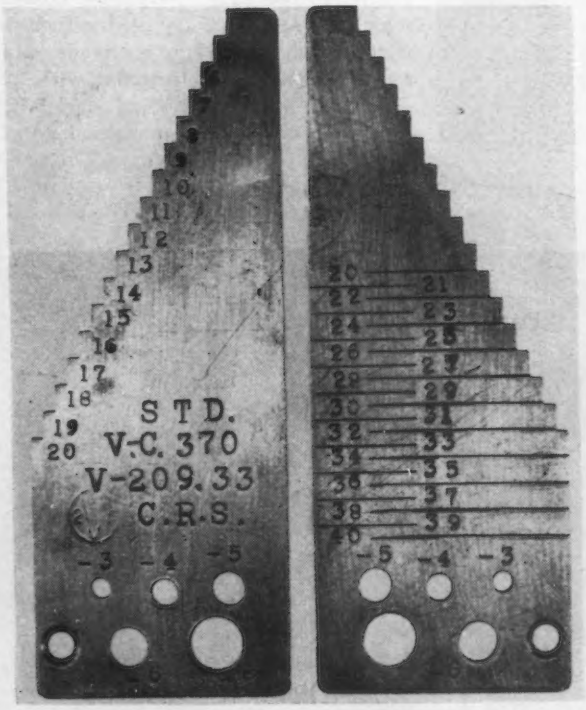
o o o

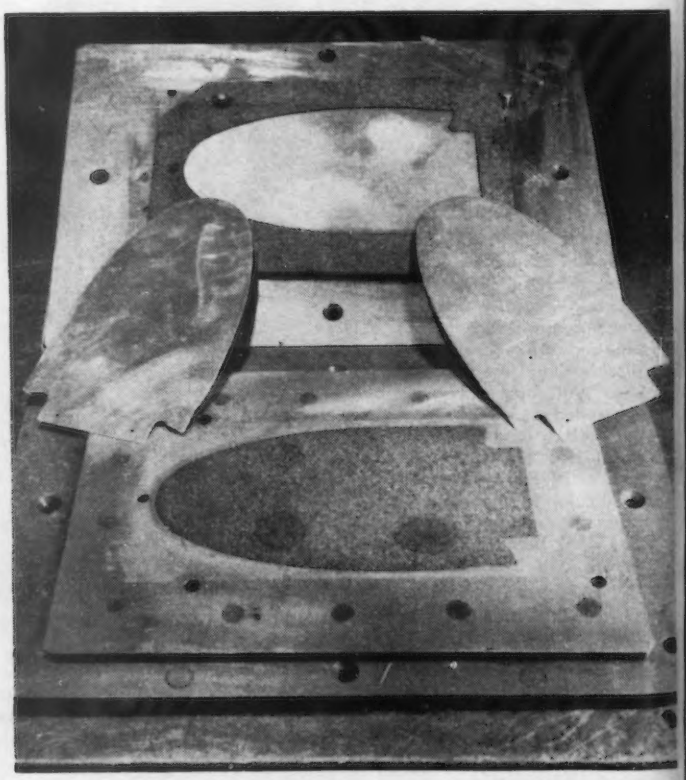


o o o

BELOW

THE replacement of rubber with cork in blanking dies, as shown above, has in addition to saving the company an estimated $10,937 a year, reduced installation time from 1 hr. minimum to an average of 5 min., eliminated warping and denting, and reduced die spreading and breaking, formerly caused by the rubber becoming lifeless. Cork ejects parts without sticking, thereby increasing output, and while rubber must be replaced every 500 to 900 parts run, with cork as many as 9000 parts have been run on one die without noticeable change in the cork.





. . . Here are some ingenious new time and money saving devices in use at Lockheed Aircraft Corp. and Vega Aircraft Corp., Burbank, Cal. Most of the short cuts were devised by workers in the company.

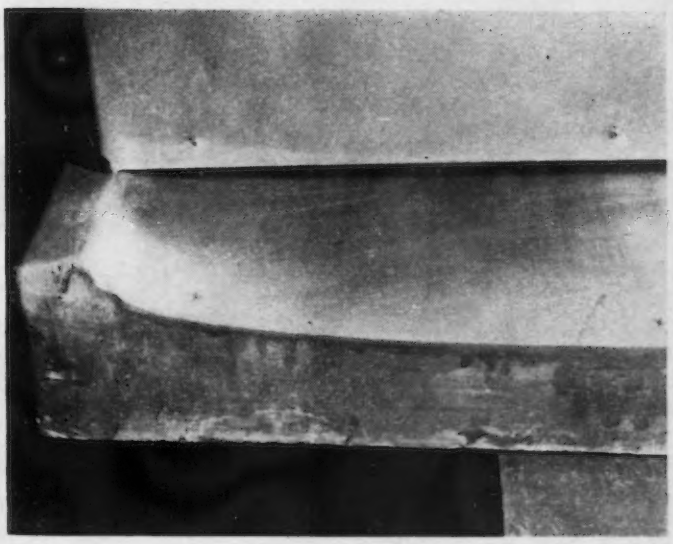
REJECTIONS of spotwelds made imperfect by electrodes with tips that have become too thin are eliminated by the electrode and measuring device shown above. A U-shaped scrap of plywood and a steel rod with a handle on it that slides through a hole in one side of the U accurately measure the end thickness of electrodes. By placing the electrode end against one side of the U and inserting the rod until it hits bottom, then measuring the distance between the outside of the frame and the rod handle, the metal remaining on the electrode tip is determined.

o o o

LEFT

THIS guide for spot welding saves the company 876 man-hours yearly. Electrodes are so designed as to incorporate the guide in the electrodes themselves.

o o o



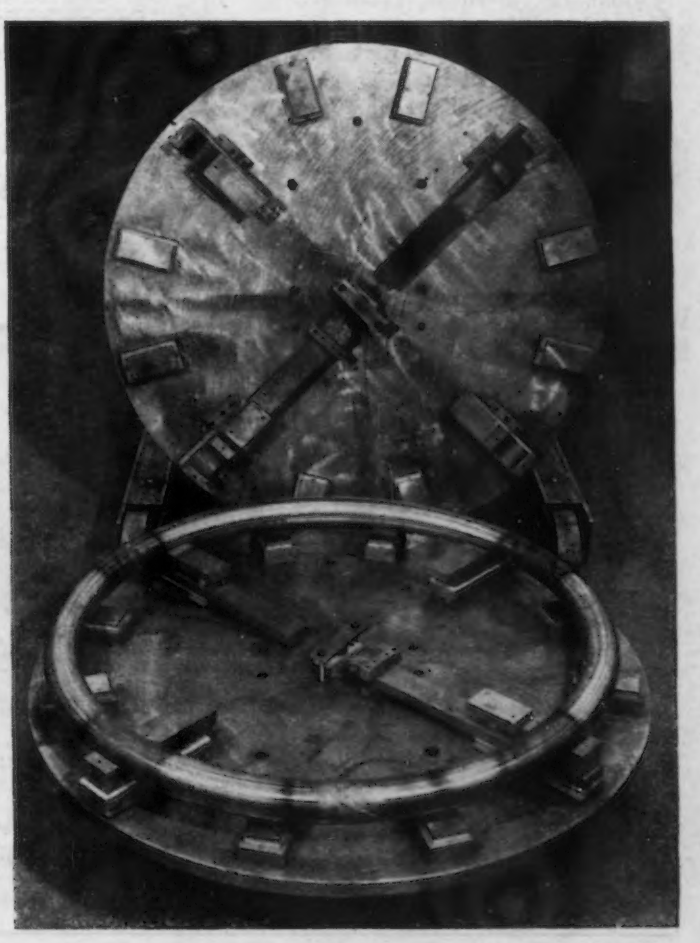
ABOVE

HAND drilling of thousands of holes has been eliminated by pin punching, as shown above. The pins are placed in the dies outside the trim line and at the time the parts are formed in the hydro-press, the holes, which are needed in order to hang the parts on racks for heat treating, are automatically punched.

o o o

BELOW

THE fixture shown below with motor mount ring makes it possible to normalize motor mount rings on a projection welding machine in approximately 50 sec., the previous average time having been 30 min. The fixture was designed for use on a 400 kva. Federal projection welder. Full floating electrode clamps, equally spaced at 90 deg., distribute the high amperage, low voltage current. An electronic timer provides pulsations of current for proper dissipation of heat from the electrode contacts. The entire fixture is clamped to the upper and lower platens of the projection welder. Since the projection welding machine will exert a force of 5 tons or more, straightening of the rings and lugs could be accomplished by properly spaced clamps and spacer pads.



. . . Creep and Heat

IN the use of the various scale-resisting chromium steel castings, the rather low heat strength must be borne in mind. It is not modified by any difference in chromium content. Table II gives approximate data for the long term load at different temperatures. In this compilation a load is given which causes a permanent elongation of about 1 per cent after 1000 hr. (The German standard creep test cannot be applied.) Heat resisting chromium steels and chromium castings exhibit strong expansion in the long term road test, and reduction of area similar to behavior in the tensile test at elevated temperatures. In general, the impending rupture will be preceded in the overloaded part by deformation.

Some examples of practical applications of heat resisting chromium steel castings and chromium castings are given in Table III. They show that, predominantly, mechanically unstressed parts are made from this material. The use of austenitic steels cannot be avoided where heavy loads have to be carried at high temperatures, for instance in free bearing furnace rails.

In order to save chromium, alloys with a reduced chromium content have lately been introduced; however, to maintain scale resistance, increased silicon and sometimes even aluminum additions have to be made. In steels for forging and rolling, a large saving has already been effected. Here the unfavorable effect of silicon and aluminum on the toughness can be balanced to some degree by hot work, but this improvement is not possible in casting. While considerable experience has been collected on the action of silicon and aluminum additions (*Archiv. Eisenhuttenw.* 1933, pp. 155 to 160), on hot worked chromium, silicon, and aluminum steels these experiences must yet be accumulated for cast steels. Although E. Scheil and E. H. Schulz (*ibid.*) showed that it is possible to produce a steel which is scale resistant up to 2192 deg. F. by the addition of 6 per cent aluminum and 6 per cent chromium, in practice, only steels are being made with a higher chromium content and lower aluminum additions, for example, steels with 17 to 22 per cent chromium and up to 2 per cent aluminum.

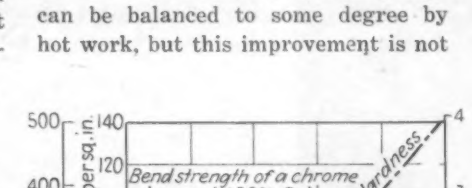

Brinell hardness
Bend strength, thousand lb. per sq. in.
Bending limit, in.
Aluminum content, per cent
Bend strength of a chrome cast (30% Cr)
Hardness
Bend strength
Bending limit of chrome cast (30% Cr)
Bending limit

FIG. 12—Influence of aluminum content on tensile properties of cast iron with 3 C and 2 Si.

For castings only, an iron with about 3 per cent carbon and 6 to 8 per cent aluminum is used occasionally in the manufacture of fire gratings and similar parts. Fig. 12 shows the influence of increasing aluminum contents upon the strength properties of cast iron with 3 per cent carbon and 2 per cent silicon. Hardness increases strongly with increasing aluminum content. The bend strength and bend limit,

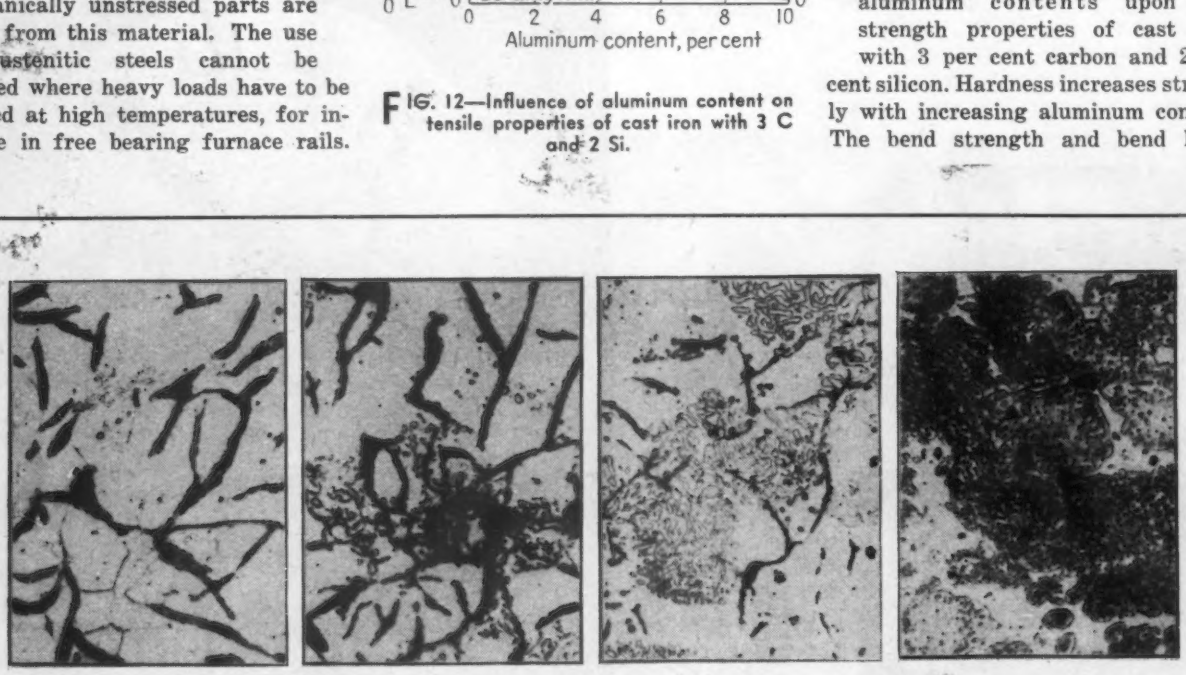


FIG. 13—Contains no Al FIG. 14—Contains 4.90 Al FIG. 15—Contains 5.70 Al FIG. 16—Contains 9.40 Al

FIGS. 13 to 16—Influence of Al content upon the structure of cast iron with 3 C and 2 Si after annealing at 1740 deg. F. (Etched in alcoholic HNO_3).

Resistant Steel Castings

. . . The alloys used in Germany in the manufacture of creep and heat resistant castings are described in this article, the first part of which appeared last week. In this concluding section attention is directed particularly to chromium-nickel steel castings, their physical characteristics and their applications.

however, decrease owing to increasing brittleness. For comparison, the bend strength and the actual bending effect of a 30 per cent chromium casting have been included. The reason for the increasing brittleness with higher aluminum contents can be seen from Figs. 13 to 16. The graphite content of cast iron decreases with increasing aluminum contents. Carbon is bound to an aluminum-bearing special carbide which causes hardness and brittleness. A cast iron with 9 to 10 per cent aluminum contains hardly any graphite.

Fig. 17 shows the influence of aluminum on scaling in air at 1650 and 1830 deg. F. Although aluminum exerts a strong influence, a satisfactory scale resistance is reached at 1650 deg. F. only with 9 to 10 per cent aluminum, at 1830 deg. F. about 12 per cent aluminum would be required. In cast iron, so much aluminum must be added to attain good scale resistance that a very brittle material results. Three to 4 per cent aluminum suffices as addition to a cast steel for a working scale resistance at 1830 deg. F. But toughness, as shown in Fig. 18, decreases more rapidly than in the cast iron, so that an aluminum steel casting has a noticeably lower toughness at 1830 deg. F. than the chrome cast iron with 3 per cent carbon. The stronger action of aluminum in the steel casting can probably be attributed to the fact that no part of the aluminum has been removed from the ground mass by carbide formation, as would happen in the cast iron.

G. Bandel (*Arch. Eisenhuttenw.* 1937-38, pp. 139 to 144) showed that scale resisting aluminum steels tend very strongly to take up nitrogen-bearing gases. This difficulty is overcome when a part of the chromium is replaced with aluminum so that steels similar to those proposed by Scheil and Schulz result. Unfortunately, these steels also are very brittle at room temperature when no hot deformation is possible. They can, therefore, be used only for simple castings which are not subjected to any considerable heat stresses in use. Complicated parts are difficult to remove from the mold. Fundamental experiments on the influence of other alloy additions on the toughness of aluminum-bearing steels were performed by H. Cornelius and W. Bungardt (*Arch. Eisenhuttenw.* 1939-1940, pp. 539 to 142) but unfortunately no suitable means were found to increase the toughness.

Heat resisting steel castings with 3 to 6 per cent chromium and corresponding aluminum contents can be used at this time only where toughness either in manufacture or use is of any importance. In respect to heat or creep strength, this chromium-aluminum steel behaves about as the ferritic cast chromium; that is, the creep strength is low and when the steel is overloaded at high temperatures the material breaks after very considerable elongation.

Chrome-Nickel

Highly alloyed chrome-nickel steels are used in the manufacture of heat resisting parts, first because of their particularly high heat strength which can be attributed to the presence of stable austenite, but also because of increased toughness at room temperatures. In Table IV, the most suitable steels of this group have been listed. High carbon contents improve castability, which is conditioned to some extent by the usual high proportion of remelting scrap in the charge. This scrap contains considerable amounts of carbon, for instance, when the scrap of case hardening retorts is used. In spite of the comparatively high carbon contents which can lead to the formation of a carbide mesh on the grain boundaries (Fig. 19) and to a strong tendency to transcrystallize, toughness is quite good in the as-cast condition at room temperature (Table IV). On slow cooling from high temperatures, numerous very fine carbide precipitations will take place in the austenite grains and cause a certain degree of embrittlement.

Fig. 20 shows the position of the heat resisting chromium steel in the ternary system in comparison with the stability limits of the various phases after long term annealing at 1470 deg. F. as determined by P. Schafmeister and R. Ergang (*Arch. Eisenhuttenw.* 1938-39, pp. 459 to 464). Whether these stability limits which were determined on chrome nickel steels low in carbon apply also

TABLE III

Examples of Uses of Creep and Heat Resisting Chromium Steel Castings

Steel With	Applications
3.00 Cr, 0.40 Mo*	Parts subjected to maximum steam pressure
4.00 to 6.00 Cr, 0.40 Mo**	Parts for synthetic fuel manufacture and oil industry
7.00 Cr	Burner housings, refractory holders, throttle dampers, door frames, lead bath crucibles, flue dampers
14.00 Cr	Glass molds, door frames
18.00 Cr	Stove plates, grates, burner nozzles, door frames, tube holders, tube walls for high output boilers, carburizing boxes
25.00 Cr	Carburizing boxes, annealing retorts, crucibles, conveyor rolls, burner nozzles, stove plates, parts for stirring, furnace rails, chain members
30.00 Cr	Retorts for carburizing, burners for oil, gas and coal dust fuel, grates for high pressure boilers

*Lately 1.00 Cr, 0.25 to 0.50 V
**3.00 Cr, 0.35 V

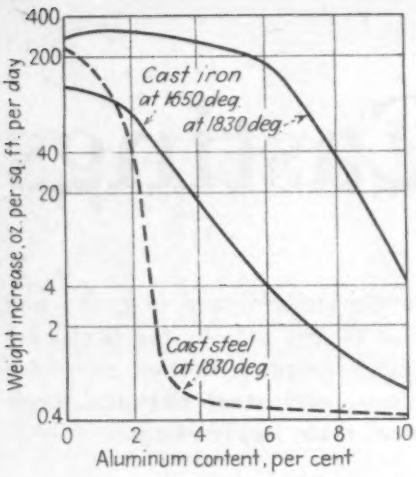


FIG. 17—Influence of Al content upon scale resistance of cast iron containing 3 C and 2 Si, after annealing 100 hr. in air. Also shown is the effect of Al content upon a cast steel with 0.20 C.

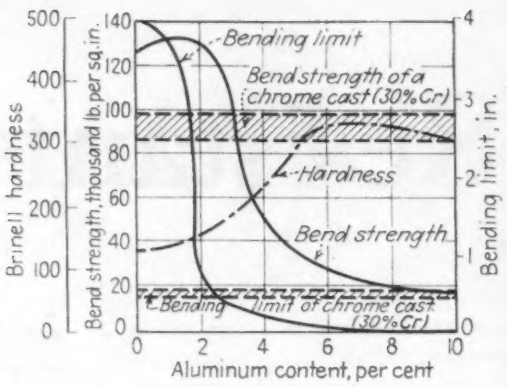


FIG. 18—Influence of Al content on the strength properties of steel casting containing 0.20 C.

to those castings which contain more carbon, is at this time unknown. But it is possible that the stability limits have been shifted to rather high chromium contents due to the binding off of carbon as chrome-iron-carbide. Steels 13, 14, and 15 are, according to Fig. 20, wholly or partially in areas where, after long term annealing between 1110 and 1650 deg. F., the brittle sigma phase can occur. Where these types of steel castings are used, care must be taken that their service temperatures lie permanently above 1650 deg. F. Because of nickel economies, these steels have lately come to the fore. Steel 16, which lies outside this area, is at this time being used only for highly stressed parts such as unsupported rails in special furnaces in which, because of the particularly difficult service conditions, the heat strength of Steel 15 is insufficient. Steels 17 and 18, which were formerly used extensively for cyaniding pots, are hardly in use at this time.

As shown in Table IV, the permanent load at elevated temperatures increases with increasing nickel content, although a visible change in the structure of the steel does not occur after a composition of 12 per cent nickel has been reached. It is surprising that Steel 13, although containing considerable amounts of ferrite, has markedly more favorable permanent load strength than the ferritic chromium steels. During the creep test, semi-austenitic and austenitic chrome-nickel steels used in castings tear on overloading at high temperatures (1830 deg. F.) without deformation. The break occurs along the grain boundaries as distinct from the ferritic chromium castings which are brittle at room temperatures and which will break only after considerable elongation at high temperatures, as already shown. Apparently the permanent load strength is determined by the adhesion in the primary grain boundaries of the chrome-nickel steel castings, while the interior of the crystal has a considerably greater heat strength. Also chrome-nickel steel tends to strong transcrystallization and therefore develops rather coarse primary grains.

The permanent load strength of chrome-nickel steel castings is greater than that of ferritic chromium castings. Therefore, an increase in the heat strength of the chrome-nickel steel casting might be expected by influencing the primary grain size or the grain boundary material. A decrease in the primary grain size is possible only by lowering the casting temperature, but the fluidity of the steel sets limits to this procedure. The addition of small amounts of titanium or nitrogen, which causes a refinement of the primary grain in the ferritic chromium casting, does not offer a solution for the austenitic chrome-nickel steel casting. Forging should

TAB

Properties of the Usual Heat Resistant

Steel No.	Composition, Per Cent					Structure	Yield Limit Lb. Per Sq. In.	Tensile Strength Lb. Per Sq. In.	Elongation (Length = 5X Diameter) Per Cent
	C	Si	Mn	Cr	Ni				
13	0.20 to 0.60	1	...	25	4 to 6	Austenite+Ferrite	50,000	85,000 to 100,000	4 to 8
14	0.20 to 0.60	1	...	20 to 25	8 to 12	Austenite+Ferrite	43,000	71,000 to 85,000	10 to 20
15	0.20 to 0.60	1	...	20 to 25	14 to 16	Austenite+Carbide	35,000	71,000 to 78,000	7 to 9
16	0.20 to 0.60	1	...	22 to 25	19 to 20	Austenite+Carbide	35,000	67,000 to 74,000	8 to 10
17	0.20 to 0.60	1	...	26 to 27	29 to 30	Austenite+Carbide	35,000	100,000 to 121,000	10 to 12
18	0.20 to 0.60	1	...	17 to 20	60	Austenite+Carbide	35,000	100,000 to 121,000	10 to 12
19	0.15 to 0.30	1 to 2	10 to 15	12 to 15	to 2	Austenite	50,000	85,000 to 100,000	10 to 12

* Basis of measurement is a permanent elongation 1 per cent in 1000 hours.

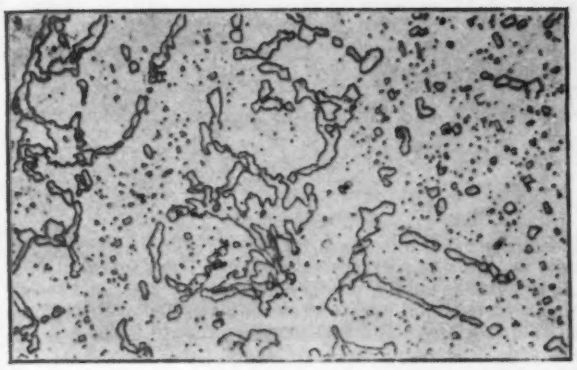


FIG. 19—Structure of heat resisting steel casting with 20 Cr. and 15 Ni. (Etched in 50 per cent concentrated HCL with 5 per cent H_2SO_4).

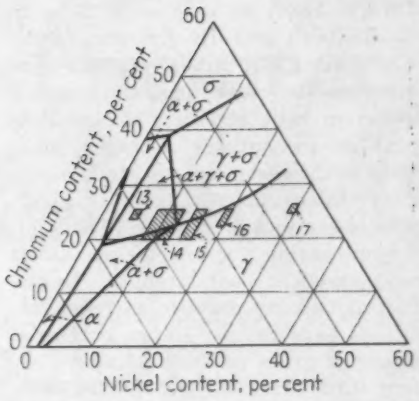


FIG. 20 — Position of heat resisting chromium-nickel steels (according to Table V) in iron-chromium-nickel ternary system.

act in the same manner. A comparative experiment with forged samples of Steel 14 did not show an increase in permanent load strength over the as-cast condition.

While an increased carbon content did not have a noticeable influence on the scale resistance of chromium steels, chrome-nickel steels are influenced to some degree by carbon. A steel of 20 per cent chromium and 20 per cent nickel did not show increased surface scaling at 2010 deg. F. in air when the carbon content was increased, but it was found in the microscopic analysis that a preferred scale attack takes place in the carbide mesh along the grain boundaries. This attack, however, is even quite distinct when the carbon amounts to only 0.18 per cent, and can be avoided completely only when the carbon is very low. When the carbon content was increased from 0.18 per cent to 1.2 per cent, no increase in the intergranular attack was observed. Therefore, it seems justified to use occasionally increased carbon contents, if, for instance, in difficult castings micro-pipes can thereby be avoided.

The high coefficient of expansion of these steels needs to be borne in mind (Table IV). This fact is of particular importance when chrome-nickel steel parts are built into ferritic steel constructions. Apart from the high heat strength in some cases, the great toughness of austenitic or semi-austenitic chrome-nickel steels can be the most important consideration. The heat conduction is just as low as in the highly alloyed chromium steels. Castings from heat resisting chrome-nickel steels are nevertheless not nearly as sensitive toward rapid temperature changes because of their greater toughness at temperatures of red heat. The sensitivity toward sulphur-bearing gases increases with increasing nickel content. However, this sensitivity will still be within technological limits up to a nickel content of 10 per cent if the chromium content is sufficiently high.

A number of examples of application of heat resisting chrome-nickel steels for casting are given in Table V. The use of heat resisting chrome-nickel steel castings has lately been greatly limited in order to save nickel. At this time, steel qualities are preferred which contain small percentages (Steels 13 to 15) of nickel and which are used mainly for stressed furnace parts such as rails, charging boxes and chains in furnaces.

Up to about 1740 deg. F. austenitic chrome-manganese-silicon steel (Steel 19) can replace chrome-nickel steel castings. This material, which has been in use for a number of years as rolling mill quality, has not been applied in the past to castings because of the disagreeable casting properties which apply to all manganese rich steels. The temperature limit of 1740 deg. F. for the application of this steel is due to the fact that chromium cannot be increased beyond 15 per cent because of the formation of the inter-metallic compounds and also because the manganese content is unfavorable to scale resistance.

F. Rapatz (*Stahl und Eisen* 1941,

LE IV

Chromium Steel Casting Alloys

Creep Strength,* Lb. Per Sq. In. at Deg. F.						Scale Resistance in Air		Mean Coefficient of Expansion Between 68 and 1470 deg. F. (0.001 mm. per meter per deg. C.)	Specific Gravity
1110	1290	1470	1650	1830	2010	Permanent Service, Deg. F.	Maximum Temperature, Deg. F.		
5700	3500	1400	570	280	...	1830	1920	18.5	7.7
11,000	6500	2800	1100	560	110	1740	1920	18.5	7.7
11,000	7100	3500	1400	710	140	1920	2010	18.4	7.7
11,000	7100	4000	1800	853	170	2010	2100	17.6	7.8
11,000	7100	4300	2100	1000	199	2100	2190	16.9	8.0
11,000	7100	4300	2100	1000	199	2100	2190	19.0	8.2
17,000	10,000	2800	....	....	...	1560	1740	20.0	7.8

1073 to 1078) as well as R. Scherer, R. Riedrich and H. Kessner (*Stahl und Eisen* 1942, pp. 347 to 352) have reported on other means of saving nickel in heat resisting steels. It is possible by suitable nitrogen additions to the chrome-nickel steel to produce stable austenite with considerably lower nickel contents. These nitrogen-bearing chrome-nickel steels have excellent heat strength. In the field of foundry practice, nitrogen additions have become known only as a means of grain refinement in the ferritic chromium castings. On the basis of excellent experiences with rolling mill quality material, it will be necessary to investigate also the influence of nitrogen additions on heat resisting chrome-nickel casting alloys. It appears to be more difficult for the foundryman to add nitrogen to his product than for the maker of hot deformed steels, because the conditions of solidification are strongly differential in the case of a casting and can easily cause nitrogen segregation in the form of blowholes. This danger is not usually as great in ingots and generally casting temperatures are higher in the foundry than in the manufacture of ingots. The use of nitrogen as an alloying element means for the foundryman that the nitrogen content must be accurately determined in the metal bath and that by suitable temperature control the formation of blowholes in the casting must be completely avoided. [*Translated by C. M. C.*]

TABLE V

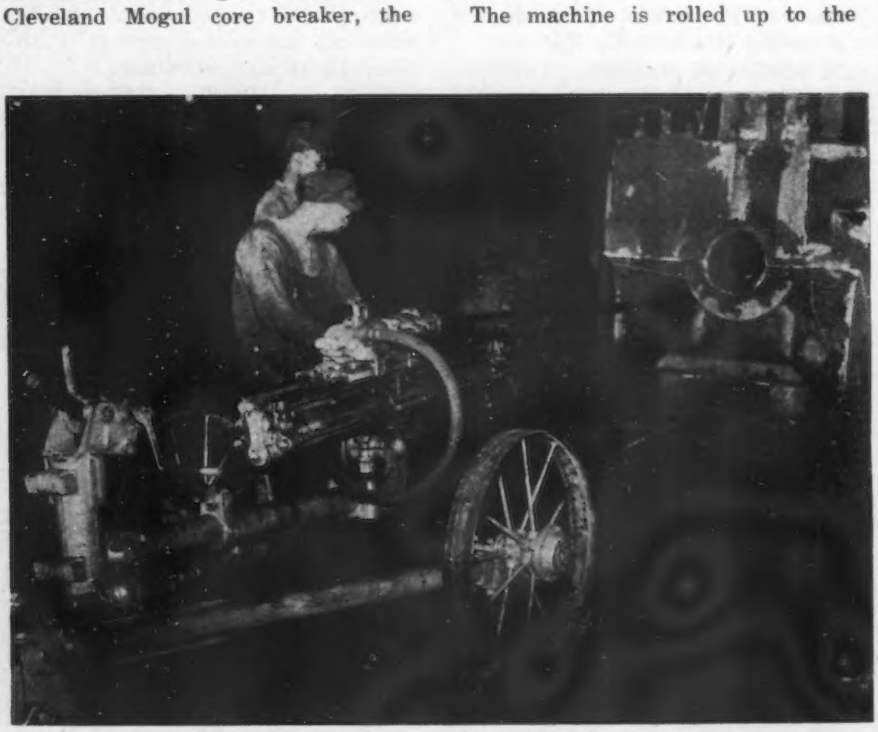
Examples of Uses for Chrome-Nickel and Chrome-Manganese Steel Casting Alloys

Steel With	Applications
25 Cr, 4 to 6 Ni 20 to 25 Cr, 8 to12 Ni	Tube suspensions, tube walls for high pressure boilers, parts heated on one side only, for example flue dampers, similar to 30.00 Cr castings but for heavier mechanical stresses, not sensitive against heat and impact stresses, for example stirrers and lead bath crucibles. Rather insensitive toward sulfur bearing gases.
20 to 25 Cr, 14 to 16 Ni	Furnace parts, annealing retorts
22 to 25 Cr, 19 to 20 Ni	Carburizing boxes, furnace rails, annealing retorts, chain members, furnace parts for annealing furnaces, annealing feeders, troughs and plates for glass manufacture
26 to 27 Cr, 29 to 30 Ni	Carburizing boxes, stove plates, furnace rails

Time Saving Core Breaker

A PNEUMATIC machine especially adapted to remove cores from heavy castings has been developed by the Cleveland Rock Drill Co., in close cooperation with the Fulton Foundry & Machine Co., makers of Meehanite castings. Known as the Cleveland Mogul core breaker, the machine consists of a powerful pneumatic hammer mounted on wheels. The hammer-vibrator can be quickly raised or lowered or swung from side to side. Standard 1¼ in. round drill steels with detachable bits are employed.

The machine is rolled up to the casting to be cleaned, the hammer raised to position, and the drill bit fed into the core. The quick-acting pneumatic feed is used to ram and withdraw the steel bit into and out of the core. The combination of the ramming action, the hammering, the rotation of the bit and the consequent vibration results in the quick disintegration of the hardest and most heavily rodded cores. An attachment for pulling rods out of large cores is now being developed.



It is claimed that in actual service, the unit permits cores to be cleaned out of heavy castings in from one-half to one-eighth of the time required by regular hand pneumatic core-breaking methods and work can be begun on much hotter castings.

Long crane drum castings weighing 12 to 14 tons, which formerly required the work of four men three days, were cleaned by two men in less than a day with the Mogul. The cores of cylinder liner castings, usually requiring an average of 3 hr. core knockout time, were removed in 15 min. Marine cylinders weighing close to 12,000 lb. each, which formerly required 45 to 50 hr. to remove cores, were cleaned in from 12 to 14 hr.

Iron & Steel Engineers Discuss Steel Mill War Problems

. . . Iron and Steel Engineers flocked to the William Penn Hotel at Pittsburgh, Sept. 28-30, to bone up on those technical problems and solutions which are expected to blaze a new history in the steel industry's war time operations. The list of papers at the Iron and Steel Association three day meeting ran the whole gamut from fire protection, manpower situation, chain repairs, blast furnace operations, steel cartridge cases, all the way to the development of a practical safety program. Some of the papers are reported herein.

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WHILE members of the Association of Iron & Steel Engineers listened to various papers on how well they were doing their job, how they could do it better or were getting new shortcuts and wrinkles to an ever-increasing production, a steel company executive and a WPB iron and steel branch head discussed such subjects as the possible political atmosphere in the post-war period, and the current controversy between open-hearth alloy and electric alloy steel.

Terming conversations about competition which steel will encounter from the lighter metals and plastics as "a lot of loose talk," W. Sykes, president, Inland Steel Co. went on record that steel will retain its place as a dominant metal after the war. He argued that there is no other metal which has the unique properties that make steel so valuable from engineering and constructional standpoints. He further estimated that pent-up demand, both in this country and abroad, will be met by something like 75 million tons of capacity annually in steel plants that can be economically operated and be competitive in post-war years.

This latter statement by Mr. Sykes garnered considerable attention in view of the fact that current steel capacity is now more than 90 million tons, and may be close to 94 or 95 million within the next several months. Like other observers in the steel industry, Mr. Sykes obviously sees the abandonment of some obsolete and high cost capacity, which is only being used because of the war pressure.

Political Uncertainties Ahead

Despite his optimistic statement about the future of the steel industry, Mr. Sykes termed the greatest uncertainty in our future picture to be involved in the political atmosphere that will exist in the post-war period. "We have many in government circles who think that we are not capable of running our own affairs, and that they can do a better job of planning for us than we can do ourselves."

"I don't believe that their performance so far would indicate that this is true, because no matter what the shortcomings of private industry may be we only have to look around us and read our daily papers to see the horrible mess that we are getting into in our domestic administration and the attempts at regimentation that are being made to fit every one into some preconceived pattern," Mr. Sykes charged.

Remarking that a public works program must be paid for by taxes or by borrowing, Mr. Sykes said "As our Washington planners assume that people can never be employed after the war in gainful occupations, they are advocating a public works program vaster than any ever known before. We are to rebuild cities, civic centers, roads, etc., whether these works serve immediate needs or not. It is significant that these enthusiasts are invariably people who have not had the responsibility for operating an enterprise nor had the responsibility to maintain any enterprise in a sound financial condition."

As a parting shot, in his argument that the government should use its taxing power only to support the government and not as a roundabout means of effecting social changes, Mr. Sykes said "If it is a good thing to change our American system, let it be discussed openly and debated by the public, and then decided at the polls. We don't want any planners in Washington monkeying with our constitutional freedom by using taxing powers to destroy our existing institutions."

Following Mr. Sykes' blast against political interference with private en-

terprise, another industrialist, J. T. Whiting, now director of the WPB steel division, gave the steel industry a pat on the back for the good job it has done after 22 months of war. At a time when the steel industry is reaching unheard of heights in production levels, he pleaded for the industry to consider today's production levels merely as a base from which to rise to a new peak of production.

Shift to Electric Steel

He probably drew some fire from old-time steel production men by asking "Has steel, after 22 months of war, lost its victory punch?" However, as it has done in the past, regardless of the pyrotechnical verbiage and governmental speeches, the industry as judged by past performance and current goals will probably supply "more than enough" before the battle is over. That it can do so was fairly well substantiated in Mr. Whiting's statement that the electric steel program will be finished this year, and that more alloy steel orders should be taken from the open hearths and given to the electric furnaces. Indirectly, this was regarded as a tacit admission that open-hearth operators throughout the country, in heeding WPB's request to make more alloy steel sometime ago, had gone beyond the wildest expectations of WPB officials. At any rate, Mr. Whiting struck a responsive chord when he said "The more you can shorten the war, the more lives you can save and the less the damage that will have to be repaired after the war. The first step toward post-war planning should be the winning of the war. If the war lasts many years, no post-war markets worthy of the name will return in the lives of anyone at this speaker's table."

Referring to the critical situation whereby some electric furnaces had been idle recently and urging a transfer of some alloy steels from the open hearth to electric furnaces, Mr. Whiting said: "We cannot afford to have idle electric furnace capacity because of this expansion and because of our past successful efforts to produce so large a part of the required alloy steel in open-hearth furnaces. We need the open-hearth capacity which would be opened up for carbon steel requirements through reduction of open-hearth alloy steel production. The electric furnace's special advantages, such as the maintenance of closer analysis limits, must now be more fully utilized for making gun, aircraft, tool and other special steels.

Blooming Mill Rolls

A practical discussion on bloom and billet mills and their rolls by D. L. Eynon and F.C.T. Daniels of Mackintosh-Hemphill Co., Pittsburgh, was well received. They claimed that the main difficulties in the use of blooming mill rolls are fire-cracking, excessive side wear on the collar, slippage, steam cutting, and breakage or due to holes and streaks of segregations. Any one of the above factors opens up a controversial field, each extensive enough to provide a complete evening's discussion. The holes and breaks in the rolls was put last as that is purely a foundry problem.

The side wear on the passes of rolls, the authors say, has been largely reduced by special heat treatments in which the sides of the passes are maintained from 4 to 6 points Scleroscope harder than that of the main body of the roll.

Slippage, it was said, is largely a matter of hardness combined with that of the percentage of draft used and the kind of steel being rolled. This is a special consideration for almost each and every mill and is often accentuated by the fact that the pitch diameter of the rolls may have been increased from time to time thus bringing it substantially above the tables and causing the piece to enter the rolls at an angle and reducing the area presented to the rolls for their bite. Breakage is an infrequent occurrence and may be due to excessive hardness of the roll, a defective casting or a mill accident. Steam cutting of the passes is sometimes encountered and is generally believed to be entirely a mill problem.

Modern slabbing mills, Eynon and Daniels said, are mainly called upon to produce stock for the continuous hot strip mills, demanding a product with a smooth, clean surface. Therefore, the rolls cannot show much surface roughness or any substantial fire-cracking. The rolls usually contain a moderate carbon content plus 1½ per cent nickel and about ¼ per cent molybdenum with a minimum of chromium. They are heat treated to the maximum hardness possible without encountering slippage. The optimum hardness has been found to be about 38 Scleroscope but in some mills it must be kept as low as 34, where others can use up to 44.

Blooming mill rolls having edging and bloom finishing passes present a somewhat different problem in that they also encounter side wear and undercutting of the passes. Rolls of about the same composition as that of slab mill rolls are most successful but heat treated so that the collars and sides of the passes are considerably harder than the rest of the roll and thus bring additional resistance to side wear.

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Non-Metallic Bearings

On the subject of lubrication of non-metallic bearings, regardless of makeup, bearings of the phenolic type have a fine resin film on the surface which is hard and slightly abrasive in action, G. E. Reiser, assistant lubrication engineer, Bethlehem Steel Co., Lackawanna, N. Y., told the engineers. This increases the operating temperature in the running-in period and calls for extra care for the first few hours of operation. Going even further, he stated that a bearing may have a perfect chuck fit, roll neck in excellent condition, skin removed from the bearing surface and still operate hot. This behavior can be caused by too large an arc of contact for the bearing. An arc of contact over 120 deg. is not desirable for synthetic resin bearings due to the resiliency of the material which, under heavy loads, will spring inward and produce a chocking effect on the roll neck or journal.

For light bearing loads, Mr. Reiser said, this behavior need not be considered. In some designs attempts are being made to eliminate this clamping by using a bearing with an inside diameter up to 1/16 in. larger than the outside diameter of the roll neck. This practice is occasionally worse than the clamping effect itself, because if the load is not sufficient to compress and cold-flow the material to the form of the roll neck, a heavy load concentration will take place, resulting in hot spots and eventual wiping of the bearing. Bearings that are jaw tight due to changing from roll to roll of different journal diameters will squeal and burn when the mill is first started. Swabbing of bearings and journals in roll changes will prevent this. Thrust collars are bound to wear excessively, regardless

of lubrication, if they don't fit perfectly into the fillet. If the collar has too small a radius, it will climb the fillet, causing spotty contact and burning. Lubrication at its best cannot rectify such a condition.

After a mill has been set up, rolls and bearings changed and pulled up tight, it is always good practice to back off the thrust adjustment screws a flat or two, Mr. Reiser warned. This relieves the collar sufficiently to allow water to penetrate and lubricate. With synthetic resin bearings the arc of contact should be just large enough to maintain roll alinement, that is, it may be much smaller than for metal bearings. Under light loading danger from hot spots is not serious. The proper contact area is gradually established in operation at a point where wear is at a minimum.

Problem of Cooling

Reduction of frictional heat by providing perfect surfaces and bearing fits has been considered, the author said. However, due to the low heat conductivity of composition bearings, a cooling medium is required for regulating their operating temperature. Knowing the critical temperature and the rate of heat generation, the problem is to determine the rate of cooling which will permit operation below this temperature. Cooling of roll necks or journals is generally accomplished by the use of water. The amount of water required for this purpose is dependent on several factors:

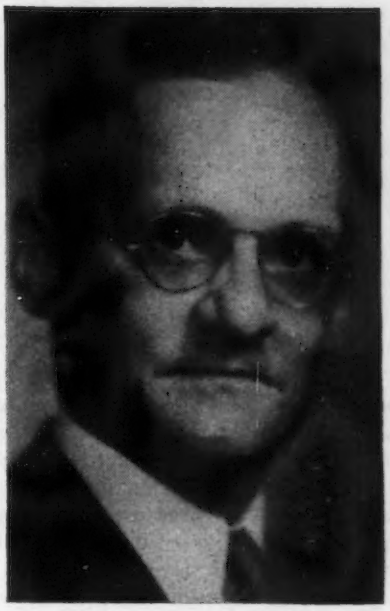
(a) The heat generated in the bearing itself.

(b) The type of work, whether continuous or intermittent, with light or no load periods.

(c) The amount of heat transmitted from the roll body.

(d) The temperature of the cooling water, its location and the exposed roll-neck area.

An investigation of lubricants as a means of producing a separating film between the rubbing surfaces has been made, Mr. Reiser said. Inability to maintain a separating film even under moderate load conditions was at once shown by water-soluble oils. The same was noticed, it was said, for most of the water repellent oils investigated. The reason for this is the inability of the oil to adhere to the rubbing surfaces. Some of the high-pressure greases operated satisfactorily at speeds of 200-250 f.p.m. and medium loads up to 1750 p.s.i., but failed badly at low speed on high bearing pressure applications. The final investigation was made with extreme pressure quality greases, and here compounds containing tallow or suet proved superior to most other types of EP media.



C. L. McGranahn, newly elected president of the Association of Iron and Steel Engineers, who will take office on Jan. 1. He is assistant general as superintendent of the Pittsburgh Works, Jones & Laughlin Steel Corp.

Graphite an Excellent Lubricant

Grease containing synthetic graphite is now used, Mr. Reiser said, which conditions both the neck and the bearing. Graphite works into the pores of the steel to give it a burnished appearance. After the resin coating is worn away from the bearing surface, the graphite is held in the fabric to give added lubrication. This has been observed time and again after the change of rolls. When the top bearing is raised off the neck, a perfect pattern of the fabric is molded in graphite on the neck. It has also been found that as long as the roll is in storage, a very small amount of rust is found, showing the protective action of the graphite.

In war times, the mechanical part of the problem in industrial engineering is still somewhat the same as it was in peacetimes, consisting of methods, planning, routing, handling cost control, etc., C. P. Spangler, Jones & Laughlin Steel Corp., said. But the difficulty of obtaining new pieces of equipment, the time lost in making mechanical changes, has made it most urgent for us to get the best production out of what we have, he added. It has become most important to study the problem of the utilization of equipment to the fullest extent with the least delays. This is particularly important on equipment which may turn into bottlenecks and restrict the production in succeeding processes. Hence detailed studies of delays are required in order to diagnose the illness before trying to write the prescription for the cure.

Scheduled Repairs Urged

Delays of small duration and some of large duration, Mr. Spangler argued, are so often taken for granted that they are not noticed, until a detailed study throws light upon them. For example, the shutting down of open-hearth furnaces for repairs when parts of the furnace have burned away and collapsed has been taken for granted since open hearths were first built. Recently several steel companies have had their industrial engineers make detailed analyzes of this problem and have learned that scheduled repairs in an orderly rotation, instead of waiting for furnaces to fall in at a time when the operating rate is rapidly declining, will increase the furnace availability time, hold up a higher average operating rate and result in a worth while annual tonnage increase.

On a blooming mill rolling 200 ingots per turn, a saving of 1 sec. in the time between ingots or in the manipulating time of each ingot means an additional 1.4 ingots rolled per turn, Mr. Spangler told association members. With 10-ton ingots and assuming only 300 operating days in the year, to allow for repairs, etc., the annual production would be increased 12,600 tons, by just saving 1 sec. of time per ingot. Studies of ways and means of accomplishing such schemes for increased tonnage have become a major wartime problem of the industrial engineer.

Turning to a new phase of the industrial engineer's job, which he must successfully consider if he expects to accomplish the maximum possibilities from his efforts, Mr. Spangler explained that it is a personnel job which is outside the function of the personnel department. The various wage incentive plans and the methods of deriving them have not changed, but making them work to produce the best results has changed. It is no longer sufficient to be just sure of the mathematics involved, getting the approval of the operating management and explaining the scheme to the men

concerned. The men must be completely sold on the plan to the point of enthusiasm and the union must be convinced that the plan offers something to the men and is not a speed-up scheme in disguise, he said.

Management-Labor Committees, as sponsored by the War Production Board, are probably here to stay and we must get used to dealing with and through labor representatives if we are going to attain the maximum cooperation required to meet war production demands, Mr. Spangler predicted. The industrial engineering department must realize its position in the personnel problem and become conscious of industrial relations. This selling job is of great importance today because there have come into the steel industry many new employees, including women, who have not been educated in the pre-war steel mill school of a full day's work prompted by initiative, interest and respect for foreman's orders. The War Labor Board has given its approval to wage incentive plans, but getting the best results out of them is a personnel problem.

Chain Maintenance

Chains are an important war adjunct. In discussing chain and chain repairs, F. W. Shaw, Columbus,McKinnon Chain Corp., Tonawanda, N. Y., listed safety rules to follow in the use of any type of sling chains. They are:

Don't overload a chain.

Don't take chances; if a chain does not look safe or does not pass inspection, repair or discard it.

Don't force a chain or hook into position by hammering.

Don't carry a load on the point or tip of a hook.

Don't insert the point or tip of a hook into a chain link.

Don't let a load rest on a chain.

Don't drag a chain from beneath a load.

Don't roll over objects with chain —use ropes.

Don't consider a chain safe because it is new; a new chain can be ruined by a single overload.

Don't trust a chain with stiff or stretched links.

Don't allow weights to fall on a chain.

Don't carry an unbalanced load.

Don't, under any circumstances, use chains that are excessively pitted or corroded.

Don't allow chain to be exposed to extremely cold weather for any length of time.

Don't apply sudden loads to extremely cold chain; this applies specifically to iron crane and BBB chain.

Don't anneal or normalize alloy steel chain.

Don't forget periodic and careful inspection.

Don't fail to use good judgment and common sense at all times.

Touching on chain defects, Mr. Shaw told what to look for in new and used chains:

1. Inspect the links on chains which have been heavily loaded. If badly stretched (as much as 10 per cent) the chain should be replaced; if the stretch is less than this figure, annealing may be needed unless the chain is of the alloy steel heat-treated type, which should never be annealed.

2. Examine the link juncture points. If the areas are worn bright or materially larger than needed for normal contact, the links probably are being subjected to twisting and shearing stresses by misuse.

3. If the link juncture points are badly worn, this would indicate that the chain had been subject to twisting loads or abrasive conditions and corrective measures should be taken immediately.

4. Examine links at the hook ends of chain carefully for signs of any abrasion or other damage coming on one or two links; replace such links and correct the operating conditions.

5. Measure the load hooks, especially if used for hooking over chain. Slightly deformed hooks can be straightened but if they are badly bent they should be replaced with new ones as the bending and straightening will cause serious loss of strength.

6. Examine all links for signs of stretching, gouging, cracks, weld failures, excessive wear or cold working. This last condition is possibly the most dangerous and the most difficult to discover—the metal fractures with little or no elongation and before fracture a highly polished, hardened surface, with tiny cracks may be observed by close examination.

In a paper on blast furnace blowing rates, E. L. Clair, vice-president, Interlake Iron Corp., Chicago, said that the blowing rate decreases uniformly with increase in hearth size, and with increase in furnace volume, as furnaces are now designed. It appears to be measured directly by stock line area.

Proper blowing rate at blow-in and the relationship between increasing wind volume and increasing ore load was then discussed. The wind volume and ore load as a percentage of full wind and full ore load is plotted against time in hours from the furnace start. This shows two empirical curves which have been developed from the data of many blow-ins, and are now used as standards by Interlake for any furnace.

o o o

Pitch As O.H. Fuel

J. F. Wilbur, superintendent, fuel and combustion, Bethlehem Steel Co., Johnstown, Pa., spoke on the subject of pitch as an open-hearth fuel. He stated there is an urgent need for conserving fuel oil, and pitch is an excellent substitute fuel. Nearly all steel plants have their own by-product coke ovens where pitch is produced; hence, each gallon of pitch used will replace the equivalent amount of fuel oil and thereby relieve at least some of the difficulties of transporting and maintaining supplies of oil.

The high percentage of free carbon in pitch, Mr. Wilbur said, produces a flame of high luminosity; whether or not this factor is responsible for faster melting (as compared with equivalent furnaces burning oil) remains to be proved. This is equally true of temperatures of the two flames, since preliminary investigations do not show conclusively that the pitch flame is the hotter. The fact remains, however, that pitch-fired furnaces are faster melting; one shop, he reported, produced as much as 10 per cent more tonnage when burning pitch, as compared with production rates for the same furnaces when burning oil.

Blast Furnace Lubrication

In discussing centralized lubrication for blast furnaces, A. J. Jennings, general sales manager, Farval Corp., Cleveland, said that the blast furnace department has some of the greatest natural hazards in the steel industry and lubrication of the bearings on the furnace tops is probably one of the most dangerous jobs that must be performed at regular intervals. In order to reach all bearings, many of which are 175 to 200 ft. above ground level, men must climb all over the top structure and in the case of some of the sheave bearings, only a monkey

or an experienced tight rope walker, Mr. Jennings stated, could reach these points. In addition, the men are directly exposed to the poisonous furnace gases for a large part of the time. In fact, oilers have been severely gassed while lubricating the skip hoist and bell mechanisms.

All of the bearings and especially the more important ones should be lubricated at least once a day. Sometimes, however, he asserted, the gas is so bad, men cannot even go up on the top for two or three days at a time, and often when they do get up they are only able to lubricate those bearings on the windward side of the furnace. In the past, this hazardous method has long been accepted as one that could not be avoided.

Safety rules require that two men always go up on the top—one to do the actual greasing of the bearings, and the other to watch him and also watch for gas fumes. In case gas is encountered, the second man attempts to get the oiler out of the danger zone, and to signal a third man who is on the job at the bottom, to bring aid.

A centralized lubricating system not alone keeps the men entirely out of the danger zone, by providing complete lubrication of all bearings from the ground level, but it also eliminates a principal source for gas leakage by giving proper lubrication to the packing seal on the distributor ring. Without adequate lubrication, this packing gland soon shrinks from the effects of the steam, gas, heat and ore dust surrounding it. With a well lubricated gland on the other hand, gas leakage is almost nil. He reported that on three different furnaces, seals are still holding perfectly after a production on each furnace of well over a million tons.

Some of the first installations on furnace tops, Mr. Jennings stated, were made back in 1930 and covered only the 25 or 30 bearings on the rotary distributor. Following these early installations, the use of centralized lubricating systems has been gradually extended to include all of the bearings on the top. A recent check-up showed that more than 50 furnaces are now equipped and materials are on hand for many additional installations as soon as the work can be done.

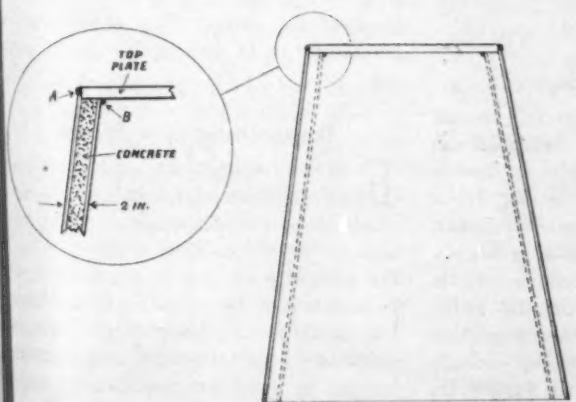
As a rule, Mr. Jennings found, the records of repair costs in the average blast furnace department have not been broken down to show which items are chargeable to lack of lubrication; therefore, it is difficult to get accurate and reliable data. However, centralized lubricating system installations on blast furnace tops have not necessarily been made to save labor or repairs, but rather to insure continuous operation and to eliminate the hazards of hand oiling.

Concrete Strengthens Welded Steel Base

CONCRETE poured between inner and outer walls of welded steel sheets serves to give a rigid, vibration-free base for a motor driven grinder of the conventional floor stand type. As shown in the photograph, the base is in the form of a truncated pyramid of square section and as indicated in the cross-sectional view there is a 2 in. section between the side walls filled with concrete. A small amount of standard concrete expander was mixed in to cause the filler material to expand slightly, adding tension to the entire assembly and providing a strong base for the grinder unit.

To form the outer shell, four pieces of 14-ga. mild steel sheet were cut to shape and tack welded together, followed by corner welding with a continuous bead. This frame was then butt welded to the ½-in. top plate. The inner shell was formed in the same way, then fillet welded to the base while the outer unit was in an upsidedown position, allowing the 2 in. wall space between the shells. Mild steel electrode, corresponding to A.W.S. class E6012, was used throughout.

This unusual base was designed and constructed at the plant of the Lincoln Electric Co., Cleveland. The cost of the base was only $8.25, material amounting to $2.25 and labor $6.



LEFT
CONSTRUCTION details of hollow welded steel base with cement filled walls.

RIGHT
CONCRETE filled grinder base installed in the plant of the Lincoln Electric Co.

New Equipment . . .

Welding

Description of new developments in welding apparatus and accessories is continued from last week's issue.

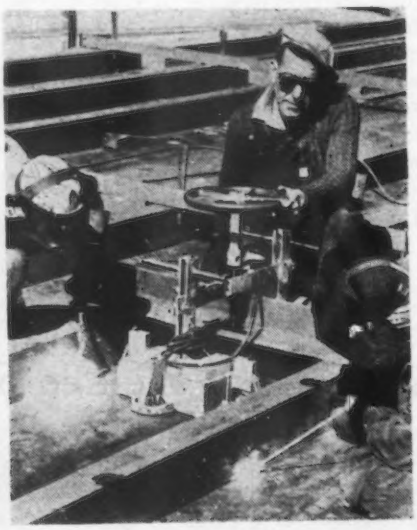
THE Simplex-Astin shiplifters jack No. 7460 has been introduced by *Templeton, Kenly & Co.*, 1022 South Central Avenue, Chicago. The 35-ton capacity jack exerts a direct push on the angle brackets, tack-welded to the plates to insure quick and accurate plate alinement and aid proper weld deposit. A sturdy anchor holds the unit firmly to the plate on which it is set.

Flow Indicating Meter

FOR measuring the rate of flow of oxygen, the *Pittsburgh Equitable Meter Co.*, 400 North Lexington Avenue, Pittsburgh, is offering the Emco flow indicating meter, calibrated in liters of oxygen per min. It operates by the principle of a floating piston where positioning is actuated by the flow of gas through an orifice of variable area. The piston is lifted by the incoming gas until its weight balances the pressure loss through the orifice area. At the point of balance the flow rate may be read directly from the pointer which is attached to the piston. Four sizes are available to record a maximum flow rate of 2, 5, 10 and 150 liters per min.

Magnetic Clamp

THE Sweetland magnetic clamp for positioning welded members is announced by *Glenn-Roberts Co.*, 1009 Fruitvale Avenue, Oakland,



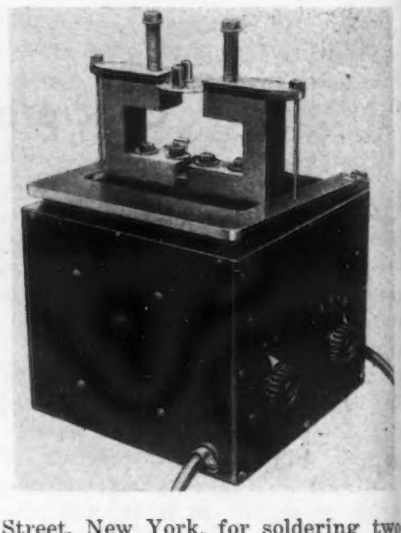
Cal. Stiffeners are positioned and held in place while the tack welds are made directly, without the use of saddles, clips or other means requiring temporary welds. Models B and C comprise two-magnet units coupled together with a yoke, provided with vertical and horizontal adjustments. The yoke carries a handwheel and pressure screw. Model B is compcsed of two 2-section magnets, while Model C utilizes two 3-section magnets. Model HVC is composed of a 3-section horizontal magnet and a 1-section vertical magnet. A G-R 12-amp. rectifier is available to supply d.c. power for use with the clamp. It may also be operated from the power supply of a motor-generator welding set or from any 80-volt d.c.

All-position A.C. Electrode

AN all-position electrode, known as Murex Type A, has been developed by the *Metal & Thermit Corp.*, 120 Broadway, N. Y. It is said overhead and vertical welds can be made without the use of a highly specialized welding technique. It is available in 3/32, ⅛, 5/32 and 3/16-in. sizes. Typical physical properties of the weld metal, as welded, include yield points of 52,000 to 61,000 lb. per sq. in., ultimate strength of 62,000 to 71,000 lb. per sq. in. and an elongation of 22 to 26 per cent in 2 in.

Electric Metal Heater

THE Type T-37 soldering transformer was built by the *American Car & Foundry Co.*, 30 Church

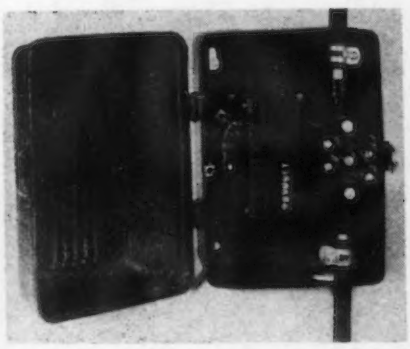


Street, New York, for soldering two brass cups to a brass disk about ⅛ in. thick, and between 2½ and 3 in. in diameter. By pressing down on the transite board, the front edges of the copper pressure shoes spring up for insertion of the disk. When pressure is removed, the disk is firmly pressed to the electrodes. There are five heat-speeds in two ranges with a load of 9½ amp. The soldering is completed in 11 sec. on this particular job.

Thermostatic Flow Switch

FOR resistance welding and other applications, an electro-thermostatic flow switch which detects the lack of proper cocling water required for adequate cooling of Ignitron tubes is announced by *Westinghouse Electric & Mfg. Co.*, East Pittsburgh. It consists of a 100-watt transformer having a one-turn secondary sho

circuited through a piece of high resistance stainless steel tubing through which flows the water from the Ingitron tubes. A normally closed two-pole thermostatic switch is used. It is available in either a 1½ or 3½ gal. per min. size in both a 25 or 50/60



cycle 220/440 volt rating, with other voltage ratings available by supplying an autotransformer.

Welding and Brazing Fluxes

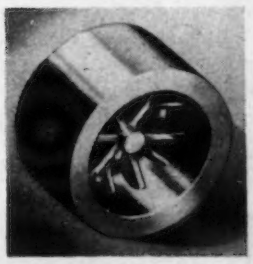
FOUR welding and brazing fluxes are announced by the *Superior Flux Co.*, 913 Public Square Building, Cleveland. Superior No. 6 is a silver solder paste flux which contains no free hydrofluoric acid. Superior No. 7 is a flux for torch welding of stainless steel and similar chrome nickel steel alloys. It is said to have unusual penetrating qualities and a low melting point. Superior No. 8 is an Inconel torch welding flux with high wetting properties. Good wetting properties are also claimed for the No. 9 flux developed for welding both sheet and cast aluminum as well as magnesium. All four fluxes are said to meet U. S. Navy and Army Air Corps specifications.

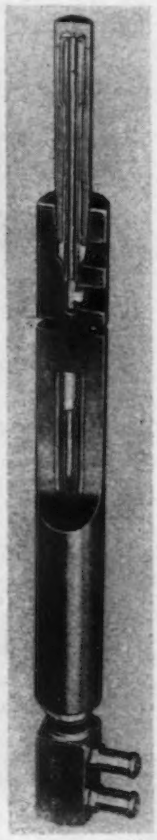
Welding Flux

PARK STEWART, 1036 Carbis Street, Worthington, Pa., announces a new flux for gas welding of aluminum. It is known as Mag-Na Flo flux and is suitable for gas welding all alloys of magnesium whether sheet or extrusions. It should be mixed to a thin paste by slowly pouring the flux into water while stirring. Only enough should be mixed for immediate use, as it will crystallize if allowed to stand more than 10 or 12 hr. For best results it is suggested that the user paint the metal to be welded, with the flux, using a small brush. It is also advisable to coat the welding wire by dipping it into a tube of Mag-No Flo flux prepared as previously suggested.

Refrigerated Welding Electrodes

FROSTRODE PRODUCTS, 19003 John R Street, Detroit, have developed the Frostpoint and the Frostcap, the latter a quick-replaceable tip on the end of the welding electrode. Greater cooling area is claimed to be obtained by internal integral finning of the Frostcap. Flow is through a coolant guide, which is fixed in the Frostpoint in such a manner as to insure a constant spacing between guide opening and inside face of the Frostcap. The return flow is through a large number of parallel passages, allowing greater area of metal to come in contact with the coolant. The units can be used on any





existing welder by inserting an adapter in the standard electrode holder of the machine. Normal cooling water circulation extends only as far as the adapter. From the adapter to the Frostcap, cooling is handled by the Frostrode coolant. This also eliminates the formation of ice beyond the Frostpoint itself in normal operation and concentrates cooling at the base of the electrode where it is desired.

Flux for Stainless Steel

SOLAR flux No. 16GH has been developed by the *Solar Aircraft Co.*, Dept. SF-27, San Diego 12, Cal., for welding of thin gage stainless steel and other high chromium bearing alloys. It can be used with most welding processes, including oxyacetylene, metallic arc, atomic hydrogen and Heliarc. The flux is said to have a high melting point and improved adhesive qualities for application to the underside and edges of metals. Application of the flux may be made several hours in advance of welding. The flux protects both rod and work from oxidization and it is claimed there is no carbon pickup. The material comes in powder form for mixing with methanol prior to use.

Hard Facing Alloys

TWO new hard facing alloys of cobalt, chromium and tungsten are announced by the *Stoody Co.*, Whittier, Cal., as oxyacetylene welding rods. Stoody 1 offers high resistance to abrasion, corrosion and heat and is recommended for hard-facing pump sleeves and the like. Stoody 6 is not quite so hard but is much more ductile and provides greater resistance to impact. It is recommended by the maker for hard facing high pressure, high temperature valves, various types of shear blades, cams, etc. Both types come in 14-in. rods, ⅛ to ⅜ in. in diameter.

Welding Lens

A NEW welding lens has been developed by *American Optical Co.*, Southbridge, Mass., through which a flame welder may look through the cloudy yellow flame of burning sodium vapors and see the rod and molten area more clearly, according to the company. Lenses made of the new glass possess all the ray absorbtive properties of the company's Noviweld glass, plus the special characteristics of Didymium, a combination of elements with high absorption in that particular portion

of the visible spectrum where high intensity sodium rays ordinarily obstructs clear vision. Three shades are available, Nos. 4, 5 and 6, corresponding with shade numbers of standard AO Noviweld lenses.

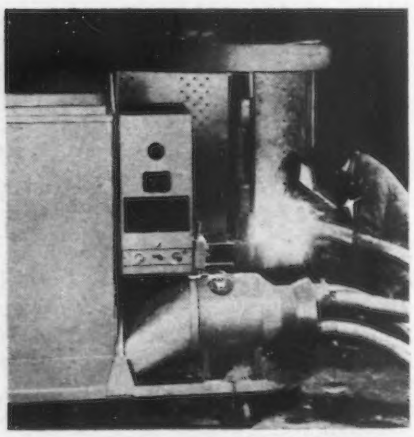
Welding Glass

A BLUE welding glass that allows better vision than the usual green glass for aluminum and bronze

welding, glass working, etc., where sodium glare is present, is announced by *Willson Products, Inc.*, Reading Pa., Alubro welding glass, as it is called, was developed for reducing sodium yellow glare only. Standard green Willson-Weld glass is still recommended for ordinary acetylene and electric arc welding by the company.

Welding Fume Remover

ONE of the latest uses of electronics in industrial functions is for removal of welding fumes di-



rectly from the scene of welding activity. A portable Precipitron electrostatic air cleaning unit with three flexible metal hoses has been adapted by *Westinghouse Electric & Mfg. Co.*, East Pittsburgh, for arc welding applications. Welding fumes drawn through the hoses pass through the air cleaner where 90 per cent of the fumes and air-borne particles are removed. The cleaned air is then returned to the room.

Welding Fume Suppressor

REDUCTION of welding fumes and vaporization of zinc on galvanized coatings by 30 per cent is claimed with the use of "No-Spat" welding fluid, made by the *Midland Paint & Varnish Co.*, Cleveland. The material is a compounded mineral oil product of low surface tension. It is also recommended by the manufacturer as a spatterproofing compound to be applied to welding jigs to minimize the work of cleaning off weld splatter after each job.

Flux for Spatterproofing Fluid

PROTECT-O-METAL No. 2 is a combination flux and spatterproofing compound for arc welding, made by *Protect-O-Metal Products*, 79 S. Sperling Avenue, Dayton, Ohio, it is brushed or sprayed into the seam to be welded and on surrounding surfaces where spatter usually collects. Oxides and impurities are said to be removed from the weld and porosity prevented. An increase of 2000 lb. per sq. in. in tensile strength is claimed. The compound is in the form of a creamy liquid that is thinned with an equal amount of water.

Turban for Women Welders

MADE in chrome tanned leather or dark gray cassimere, the lightweight protective turban for women welders, styled by John Frederics, noted New York hat designer, is announced by the *American Optical Co.*, Southbridge, Mass. The new hat can be worn with or without helmet. It holds the hair snuggly in place and protects head, ears and neck against flying sparks. The turban is assembled by snaps and is easily taken apart for cleaning. The design is such that a single size fits every type of head closely enough for all practical purposes.

Soldering Fluid

LLOYD'S No. 6 soldering fluid, manufactured by the *Lloyd S. Johnson Co.*, 2241 Indiana Avenue, Chicago, has been especially formulated for the current low tin content solders. It is claimed to have high enough capillary action to make lead-rich solders flow evenly and completely through solder joints and to provide even higher tensile strength than heretofore obtainable from 50-50 solders. It is said the material does not crawl or creep and has no irritating or choking fumes. It is put out in highly concentrated form and can usually be diluted with one to two parts of water.

Welding Cape Sleeves

THE welding cape illustrated is made with a detachable apron in front, with the snaps covered with a flap to protect them against spatter from the arc. The cape opens at the back, with adjustable snaps for a good fit, and the front seam is welted in order to prevent exposure of stitching to sparks. There is also a collar which is high enough to make

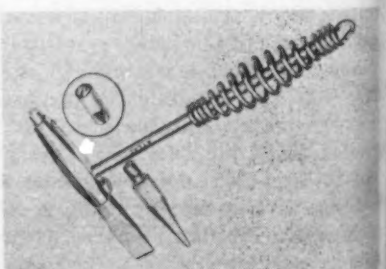
a snug fit around the neck. The apron ties in back. This No. 42 bib type cape sleeve is made by the *Rall Supply Co.*, 110 East 42nd Street, New York.

Weld Spatter Eliminator

A NEW product, Acme industrial finish Flash-Off No. 99, designed to eliminate weld spatter and the time cost of removing it, has been announced by the *Acme White Lead & Color Works* of Detroit, Mich. The mechanic brushes, sprays or wipes on Flash-Off along the edges of the metal surfaces to be joined by the weld. When the welding is done, metal chips bounce or fall off instead of adhering to areas adjacent to the seam. It also prevents pitting on galvanized or ungalvanized metal surfaces and permits immediate application of paint without cleaning operations other than wiping off. The product will be marketed in 55-gal. drums and 5-gal. cans.

Weld Marking Tool

A COMBINATION weld marking tool and chipping hammer, known as the Atlas symbol hammer, has been introduced by *Atlas Welding Accessories Co.*, 307 Boulevard Building, Detroit 2. Marking tips in



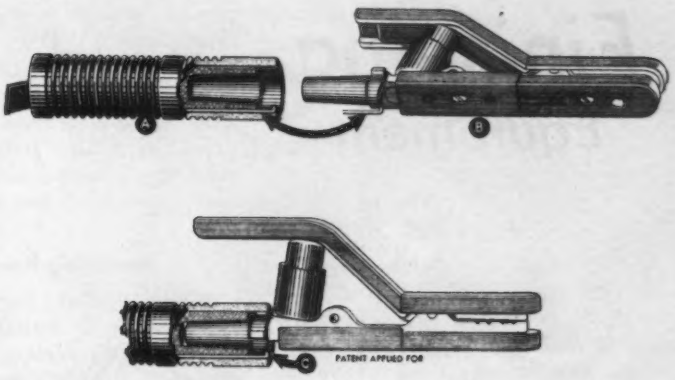
the form of alphabetical and numerical combinations are interchangeable, and the chipping bits are replaceable. Symbol and bit shank are positioned and held in a snug socket fit by set screws. Weight of tool is 1 lb.

Welder's Eyeshield

A NEW eyeshield introduced by *Jackson Products*, 3265 Wight Street, Detroit, is designed to protect the welder's eyes during operations other than welding. It tends to eliminate reflected glare, affords wide vision, protects the eyes from flying scale from chipping hammer or wire brush. Loading of welding holder, set-up work and other details may e accomplished without raising the visor face comfortably, and may be worn. The shade is light green, fits the over prescription glasses. At ease, the welder can raise the protective visor and a quick flip downward puts it back in its protective position.

Welding Electrode Holder

TO speed production welding operations, a new insulated welding electrode holder with detachable "stinger" has been introduced by *Jackson Products*, 3265 Wight Street, Detroit. The female section of the cable connector is permanently soldered to the cable lead and remains in the insulated handle. The detachable jaw section is snapped into the female section. The manufacturer claims that the use of this holder eliminates waste of time in changing cable connections and does away with dangerous loose cable ends. When necessary, the handle and the cable may be pulled through a small hole and the stinger then connected, saving time and cable extensions. This new holder, called the Jackson Quik Trik, is made in three models.



Welding and Brazing Fluxes

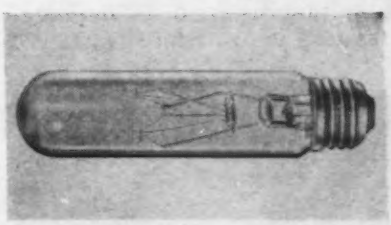
NATIONAL Cylinder Gas Co. of Chicago, 207 W. Wacker Drive, Chicago, has introduced a new line of welding fluxes for both ferrous and non-ferrous metals. National No. 1 is a flux for welding cast iron which floats to the surface the heavy oxides which form during welding and keeps them liquid. National No. 2 is a cast iron brazing flux which produces a good bond at low base temperature and holds the bronze being applied at a uniform molten consistency. Others include National No. 3, brazing flux and National No. 22 an aluminum flux. On this entire line of fluxes, noxious fumes, bubbling and boiling have been reduced and all types adhere to hot rods in the proper proportion, with reduced tendency to blow away.

Liquid Coating

A LIQUID said to prevent adhesion of welding spatter has been developed by the *Midland Paint & Varnish Co.*, 9115 Reno Avenue, Cleveland. It is known as No-Spat. No-Spat should be brushed over the seam and area where weld spatter may fall. After welding the spatter may be wiped away with no chipping or grinding necessary. No-Spat is said to fuze with the molten metal, maintain maximum tensile strength by floating off impurities and prevent porosity. It is an adequate rust protector, will not freeze and may be used over the full welding range of amperage and voltage.

Spatterproof Lamp

A NEW type spatterproof lamp for welding and rough industrial service has been introduced by the *Radiant Lamp Corp.*, 260 Sherman Avenue, Newark, N. J. The lamp is made of a special glass that resists penetration of hot metal particles and is built to withstand severe handling. Spatterproof lamps have a T10 bulb with medium screw base. Sizes include 50, 75, 100 and 150 watts. A new 200 watt lamp, guaranteed not to crack due to climatic conditions, has also been added to the company's line. The complete range is from 200 to 2000 watts inclusive.



Safety Gloves

A "FINGERLESS" steel reinforced glove, No. 14962, has been put on the market by *Industrial Gloves Co.*, Danville, Ill. The chrome tanned cowhide glove, with finger and thumb tips removed, is reinforced vertically with steel ribbons and is steel stitched. A leather patch adds extra wear and protection on palm and junction of palm and thumb. They are for use in handling sheet metal, bars, rods, stampings, castings, etc.

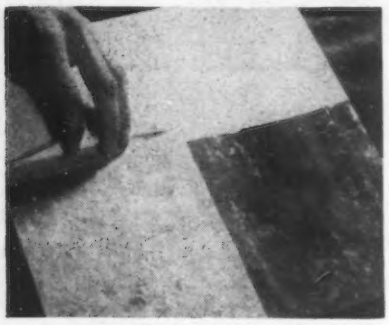
Finishing Equipment

Shop Coat

THE *Carbozite Corp.*, 1001 First National Bank Building, Pittsburgh 22, is marketing a protective coating produced to meet the requirements and specifications of various governmental departments for protection of all metal and metal parts, finished or unfinished, while in storage or in shipment overseas. The Carbozite Overseas Shop Coat can be applied by brush, dip or spray, and is easily removed by naphthas when destination is reached.

Galvanized Metal Paint

PERMANENT paint adhesion on galvanized metal is insured by preparing the galvanized surface before painting with Turco Redi-Paint, according to the manufacturer, *Turco Products, Inc.*, 6135 South Central Avenue, Los Angeles. A dark tint develops on areas properly treated, leaving the untreated area conspicuously bright. The new compound is said to displace the slick, oily surface typical of galvanized metal with a roughened, toothy surface to form a tight bond with the paint. It also neutralizes the alkalinity and passivates the metal, forming an inactive film which will not become alkaline and which is resistant to corrosion. The paint can be applied by hand or by tank immersion.



Rustproof Paints

AS an alternative for aluminum paint, two products are being manufactured by the *Rust-Oleum Paint Corp.*, Evanston, Ill. The first (No. 18328) is manufactured strictly for outdoor use and some indoor uses on metal, concrete, brick and wood, drying in from 6 to 8 hr. to a high gloss finish. Positive protection against rust, plus the appearance of aluminum, is said to be given. The No. 906 Fume-Proof Silver Gray is used in heavy industrial districts, and where smoke, brine, dampness or fume conditions are severe.

Anodizing Rack Insulant

THE insulant for anodizing racks known as Bunatol has been engineered by *Nelson J. Quinn Co.*, Toledo. It is claimed to possess all the other qualities of a superior insulant plus permanently greater flexibility. A typical spring-clip type anodizing rack, Bunatol-insulated, is illustrated. The tough, adhesive coating is said to provide a flexibility in keeping with the flexibility of the spring clips themselves, therefore does not become brittle, crack or peel when the clips are flexed. Because this flexibility is retained for the life of the insulation, it retains its efficiency and provides maximum rack protection until the contacts are entirely eaten away.

Corrosion Control Material

THE *Corrosion Control Corp.*, 34 Smith Street, Norwalk, Conn., states that Co-Res-Co, a new type of black coating, is a plastic suspended in a hydrocarbon vehicle. It is said that when it is applied and the solvents volatilize the film returns to its original state of plasticized hardness, and thereafter no chemical action of any kind takes place in contact with either atmospheric oxygen. acid fumes or actual immersion in acid, thus avoiding the chemical failure which occurs with oxidizing paints. In addition to acid and acid fume resistance, the material will also stand heat up to 550 deg. F., and is therefore widely used as a stack paint in industrial areas, it is claimed. It may be applied by either brushing, spraying or dipping methods.

Pattern Coating

HARDLAC, a protective coating for wooden foundry patterns, developed by *McDougall-Butler Co., Inc.*, 13 Norton Street, Buffalo, is a spirit varnish having all the characteristics of shellac, according to the maker. It brushes easily, dries quickly, can be sandpapered smooth or recoated shortly after application. It is made in clear, yellow, red and black, and is available in 55 gal. drums, 5 and 1 gal. and 1 qt. containers.

Metal Finish

A ROUGH metal finish called Pebble-Tex, developed in a variety of colors for protection of radio equipment, instrument panels, fire control and listening devices has been put on the market by the *Egyptian Lacquer Mfg. Co.*, 1270 6th Avenue, New York. For full protection, it is recommended that it be applied over a primer, but the pattern may be obtained with a single application on the bare metal. It is available in a variety of colors.

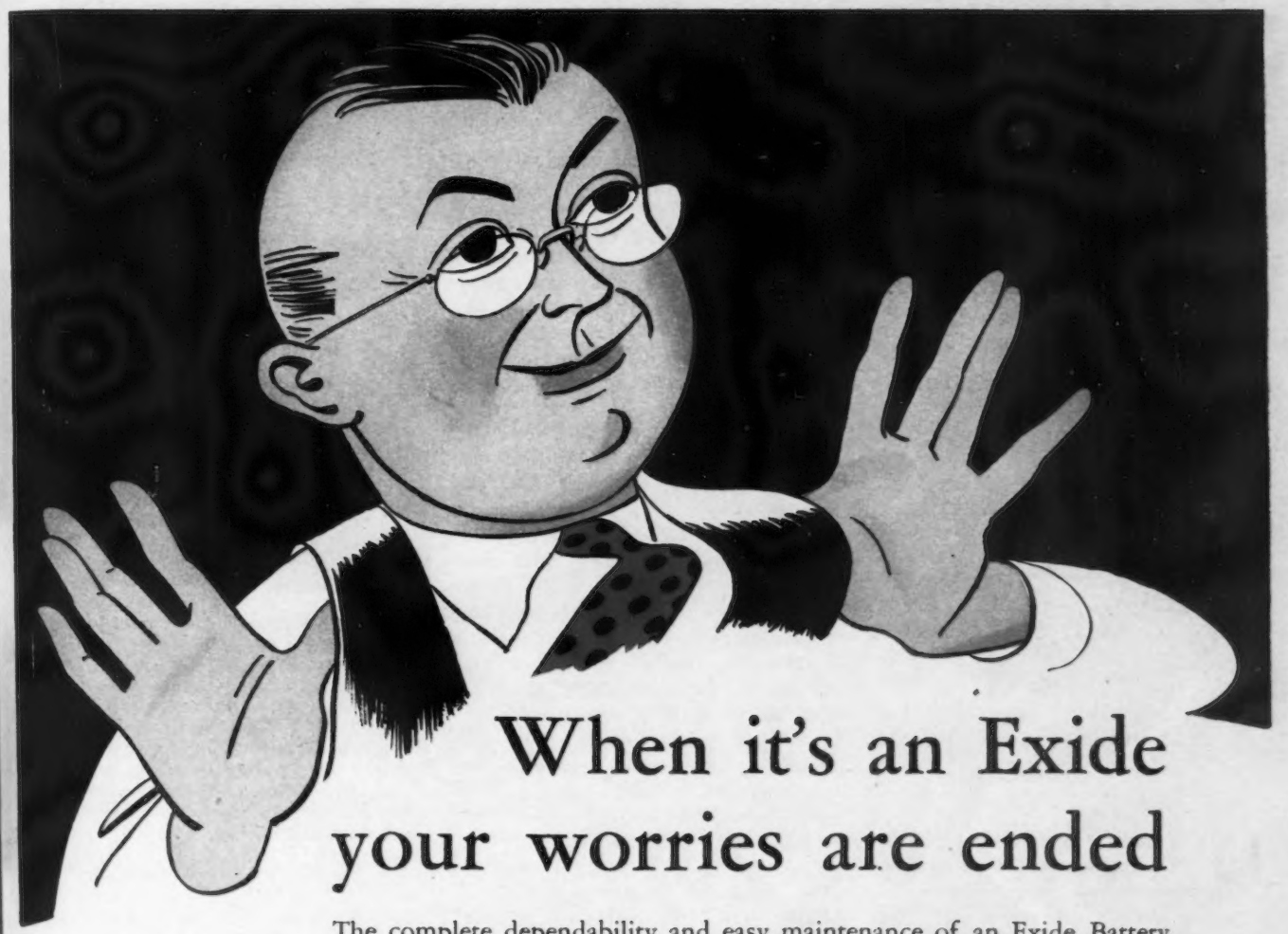
Here are shown actual photographs (unretouched) of panels finished with PEBBLE-TEX. Above shows coarse texture. This panel shows a finer texture. The size of the pattern is regulated by spray gun adjustment and application technique.

Wrinkle Finish

A NEW line of wrinkle finishes. containing no chinawood oil, has been developed by *Maas & Waldstein Co.*, 438 Riverside Drive, Newark, N. J. According to the manufacturer, the new finishes form hard, durable coatings, covering rough metal surfaces effectively in a single coat, and are applied in regular wrinkle patterns by the same methods. They are obtainable in a full range of colors.

Protective Coating

DESIGNED for use on steel coils in rustproofing systems, a protective coating material, Koilkote, has been developed by *Michigan Chrome & Chemical Co.*, 6340 East Jefferson Avenue, Detroit. It is claimed the coating can be quickly applied, and, while it adheres firmly to the steel surface, it and the deposits which form on it are easily removed.



When it's an Exide your worries are ended

The complete dependability and easy maintenance of an Exide Battery saves a lot of worrying nowadays. Those new and untrained workers you're hiring can't go wrong in handling these compact, efficient batteries . . . yet this same simply built battery delivers a terrific surge of power when needed, and gives the kind of long life which is so essential in war-time.

BUY TO LAST
SAVE TO WIN

STUDY THESE

EASY MAINTENANCE RULES

Keep adding approved water at regular intervals. Most local water is safe. Ask us if yours is. Keep the top of the battery and battery container clean and dry at all times. This will assure maximum protection of the inner parts.

Keep the battery fully charged—but avoid excessive over-charge A storage battery will last longer when charged at its proper voltage.

Record water additions, voltage and gravity readings. Don't trust your memory. Write down a complete record of your battery's life history. Compare readings.

If you wish more detailed information, or have a special battery problem, don't hesitate to write to Exide. We want you to get the long-life built into every Exide Battery. Ask for booklet Form 1982.

1. **HIGH POWER, MORE PRODUCTION:** An Exide Ironclad Battery delivers its power at high voltage to insure uniform hauling speeds. There's always a giant surge in reserve when an Exide powers your battery-propelled vehicles.

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IRONCLAD
BATTERIES

BACK THE ATTACK—WITH WAR BONDS

THE ELECTRIC STORAGE BATTERY CO.
Philadelphia
Exide Batteries of Canada, Limited, Toronto

Assembly Line.

STANLEY H. BRAMS

• Shortages in manpower are expected to bolster employment controls in Detroit . . . Women appear only means of advancing payrolls by 82,000 . . . Hudson, GMC Truck stress women worker programs.

DETROIT — Installation of a tightened system of manpower controls was momentarily expected in Detroit this week.

The system will channel all essential male workers through the United States Employment Service. Compulsion will not be present at any stage of the referral of men to jobs, but likely enough the indirect pressure which is bound to accompany a rigidly controlled system of the sort will bring satisfactory results.

Major Detroit manufacturers opposed the program, feeling that they have handled their manpower problems satisfactorily up to now without supervision from a federal agency. Probably it is a little more than a bit true, also, that tacit acceptance of such a plan would bespeak their agreement with the WMC belief that an urgent manpower shortage exists in Detroit—which conceivably could cut off the inflow of new contracts for the area, although this is doubtful. Industry sources also say rather tartly that the referral of manpower from USES will not be efficiently done, for the "main and simple reason," as Penrod would have put it, that industry long since would have hired capable administrators operating at USES under the comparatively low wage scales there.

Further, say industry representatives, if an additional 82,000 workers are all that will ultimately be necessary, the problem has a simple solution. Increase today's efficiency 10 to 15 percentage and worries are over. This stand is something like the classic fable about the mice: They had a good way to keep track of the cat, by putting a bell around her neck which would tinkle when she approached. The cat's bell and increased plant efficiency both impose some difficult problems in installation, however, although it must be said that progress is being made in the latter direction at many shops.

Organized labor sources do not find any particular complaint with the plan, except that it does not include women workers. Labor leaders anticipate that if women are free agents in the labor market while men are not, they will obtain the best jobs. The rejoinder from WMC on this is that its function is to step in where shortages exist, and that so long as there is no shortage of female labor as yet, there are no grounds for supervising and controlling that field.

The size of the potential female labor market is beginning to be a debated question. Since about a year ago, the increase in employment in Detroit area has been entirely due to hiring of women. A year ago, employment in Detroit area stood around 550,000 persons—500,000 men and 50,000 women. Today it totals 500,000 men and 190,000 women.

WHILE the manpower supply in the past year has stood on an even line at the half-million mark, it now shows signs of beginning to go down due to drafting of around 4000 factory workers a month. Women workers, therefore, are looked upon as the only reservoir which can bring employment up to a peak of about 770,000 workers some time next year. The large question is whether womanpower can stretch to the point where it provides today's 190,000 women workers, plus an extra 80,000 to enlarge payrolls to peak, plus 15,000 to 20,000 more to replace draftees called in the next several months. That comes pretty close to an aggregate of 300,000 out of a total working force of 770,000.

In the light of some distaste among women after they try factory work, and because the supply of single or childless married women is dwindling, moves are under way to furnish all possible data to automotive plants on how best to utilize women workers with children hitherto preventing them from working.

FORD BUYERS: The purchasing organization at Ford Motor Co., revamped to bring the buying organization into closer contact with production heads, is in charge of Claude Nelles (left) and Howard Kellogg (right). Both are veterans with Ford. Mr. Nelles formerly was in charge of the steel division, while Mr. Kellogg formerly handled engineering purchasing.

A basic method lies in establishing child care centers, some 50 of which now exist in Detroit, operating mostly in schools with funds primarily furnished by the federal government under the Lanham Act. But these centers are utilized to no more than half their potential capacity today, and there are none in many areas where they are most needed by working mothers.

A program is being drafted, therefore, to furnish details on methods of setting up such centers to top plant executives and supervisory and personnel help as well, so the word can be filtered down to the rank and file of working mothers, active and potential. In addition, a full-fledged publicity campaign is contemplated whose objective will be to bring mothers to war plants as job applicants.

Hudson Motor Car Co., for one, doesn't appear to need this course of instruction. Hudson has just opened the first child day care center set up in Michigan by a major manufacturer.

THE GMC Truck and Coach Div., at Pontiac, has a large-scale program well under way for employment of women, one which is surmounting many hurdles which generally appear. This division of General Motors is de-

IT'S NEW! IT'S LIGHTER! IT'S FASTER!

Greenfield's #1618

Rapid inspection limit snap gage

SEE HOW
THE LONG ANVIL
SIMPLIFIES YOUR WORK

1 It is especially adapted for gaging lengths of recessed or drawn parts. Equally suited to gaging diameters of round parts.

2 It enables the operator to quickly locate and level the work before moving it towards the "Go" and "Not Go" anvils.

3 Aligning the work with the measuring points permits more rapid handling and faster output.

4 It tends to eliminate the uneven wear of the lower anvil often shown on the conventional style gage caused by uneven approach of the work to the gage.

5 On work in the machine, it facilitates rapid checking of diameters.

"Greenfield" is happy to present this newer, faster gage at just the time when speed with accuracy is so greatly needed. This No. 1618 gage is considerably lighter than the conventional snap gage of the same capacity, yet its design assures strength and rigidity.

Write today for descriptive pamphlet, giving full specifications.

GREENFIELD TAP AND DIE CORPORATION
GREENFIELD, MASSACHUSETTS
Detroit Plant: 5850 Second Blvd. Warehouses in New York, Chicago and Los Angeles

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TAPS • • • • DIES • • • • GAGES • • • • TWIST DRILLS • • • • SCREW PLATES

pending importantly and increasingly on women to get out its production load, utilizing them in many types of jobs hitherto believed impractical to assign to women.

One out of four employees in the plant is now female, and that proportion will rise to one in three in forthcoming months.

Comparatively few of those at present on the staff have small children requiring care during work hours. For these, the Pontiac school system has set up child care centers.

Women put on the payroll are introduced to shop procedure and methods in a definitely practical way. Rather than undergo training in classrooms removed from the factory itself, their training starts located adjoining manufacturing processes, so they become accustomed, while in groups and while under supervision, to the strange noises of the shop. Nothing is taken for granted: Such common tools as pliers, screwdrivers and wrenches are identified and described. Progress is gradually made to more complicated assemblies and subassemblies, to acquaint the women with factory routines. The women catch on quickly, say shop instructors. From this type of work the women go on to learn the particular operations to which they are assigned.

With respect to the physical capabilities of women for war jobs, the Automotive Council for War Production has developed some interesting factors which must be provided for in female job arrangements.

The average woman, the studies disclose, is definitely limited in her muscular attainments as compared to a man. Industrial studies show that only 54 per cent of women's weight is strength as against man's 87 percentage—resulting in such differences as a 48 lb. pressure exerted in a woman's hand squeeze, as against man's 81 lbs. Women also have shorter arm reach, and shorter average stature, necessitating lower work benches with narrower tops.

o o o

Detroit

• • • Civilian truck manufacturing having been permitted for the current period and next year, the next step is logically a "new model." Signs pointing to a new truck model appeared in Detroit last week when a major manufacturer began to place orders for approximately $200,000 in rough castings for dies. Customarily such castings are aged for about six months before machining, which would mean that the manufacturer hopes that current allocations through June, 1943, will be extended—and enlarged, too, because considerably greater volume than now authorized will be necessary to justify the complete costs of making the new dies.

THE volume of subcontracting by 252 corporations and their subsidiaries has been surveyed by the Smaller War Plants Corp. The distribution of each contract dollar is shown in the table at the top. The breakdown of subcontractors by size groups is shown below.

Item	By Prime Contractors	By Large Subcontractors
For raw materials and supplies	$ .16	$ .31
For subcontracts (fabricated parts, etc.)	.35	.13
For value added by contractors	.49	.56
Total	$1.00	$1.00

	By Prime Contractors		By Large Subcontractors	
Number of Employees of Subcontractor	Per Cent of Total Subcontractors	Per Cent of Total Dollar Volume Subcontracted	Per Cent of Total Subcontractors	Per Cent of Total Dollar Volume Subcontracted
Over 500	29%	75%	30%	56%
100 to 500	29	16	34	27
Under 100	36	9	35	17
Unclassified	6	*	1	*
Total	100%	100%	100%	100%

*Less than 1 per cent.

Milestones

• • • **Ferracute Machine Co.**, Bridgeton, N. J., is planning to observe the 80th anniversary of its founding on Oct. 23. The company was established in 1863 as a small machine shop by the late Oberlin Smith. Ferracute pioneered in the development of power presses and their application to many industries.

In recent years the company has devoted practically all its facilities to the production of ammunition presses, but extensive plans have been made for post-war development.

Increase War Production, C. E. Wilson Tells Foremen

Dayton, Ohio

• • • **Foremen of industrial** America-at-war were hailed for their part in the drive for increased war production and challenged to even greater effort by Charles E. Wilson, executive vice-chairman of the War Production Board, speaking to the nationwide convention-by-radio of the National Association of Foremen. "No one who has not been in actual battle can fully realize the immense amounts of material that are destroyed in attacks on fortified positions in modern warfare; the only assurance of victory lies in ample reserves," said Mr. Wilson.

Foremen's clubs and listening groups met throughout the United States and Canada, received the broadcast, and then proceeded to local business and discussion.

Plan Pending to Use Inventory Steel for Zippers

Washington

• • • **Officials of WPB** said last week that consideration would be given to appeals from slide fastener manufacturers to consume steel stocks in their possession pending receipt of materials from the Steel Recovery Corp.

•

Essential Wire Rope Plastic Under Allocation

Washington

• • • **Polyethylene**, a plastic material used in manufacturing wire and cable, and polyethylene scrap were placed under allocation last week by WPB, through issuance of Allocation Order M-348.

The Useful, Accurate Life of Ordinary Plug and Ring Gages

Multiplied Five Times

When they are

CHROME PLATED BY LINCOLN PARK

Lincoln Park manufactures new chrome plated plug and ring gages and also salvages worn steel gages by chrome plating. The average wear-resistance of these gages is approximately five times that of similar steel gages.

In addition to the longer life which can be expected of them, Lincoln Park chrome plated gages can be specified to much closer required limits than steel gages. Because allowances for wear can be reduced considerably, your production departments get the resulting benefits of greater manufacturing tolerances.

If your steel plug and ring gages are subjected to average use in inspection, it is to your advantage to compare them carefully with the chrome plated gages supplied by Lincoln Park. From every standpoint, you'll find that chrome plating gives you much more for your "gage dollar".

ARMY E NAVY

LINCOLN PARK TOOL and GAGE CO.

LINCOLN PARK, MICHIGAN

Washington . . .

L. W. MOFFETT

• Private enterprise faces supreme challenge and must be prepared to show its superiority over government control . . . Notoriously inefficient in operation of industry, government is planning biggest monopoly.

WASHINGTON — It is not strange that the desire for profit should be the mainspring in the move to destroy free enterprise.

But more difficult to rationalize is the fact that the chief weapon of those who seek to destroy private business is that it is financed through public investment. Leftist logic for collective ownership of business is that: "Since corporate management doesn't own business, why should it be permitted to control it?"

The answer to this sophistical question is simply that corporate management has sparked American industry to the highest levels of efficiency. It has taken the risks. It has fostered invention, created marketing ideas and methods and made undreamed of development of this vast continent possible in the short space of 300 years. It is entitled to the authority and adequate compensation as a matter of fair play.

To make larger business possible, the public was asked to invest its money. Those investments have more often than not supported widows and orphans. Business investments are the basis of United States credit. More, private business has furnished the means by which government has been supported through the taxes it pays, and through the employment of millions of workers who also pay taxes.

Is it a just reward or adequate compensation to the investor for the government merely to purchase with the taxpayers' money (which he will have to pay back) the stocks of private corporations? Government ownership would deprive individuals of the right to speculate and invest. It will prevent citizens from leaving property to their dependents.

"Liberal" reasoning compares capitalism to feudalism. Vice-President Henry A. Wallace has said the war is a continuation of the "people's revolution." Leading "liberals" have said that government ownership of private business is as inevitable, just, and democratic as the destruction of feudalism by the serfs who stormed and looted the castles of the robber barons of medieval Europe.

PLAUSIBLE? These arguments seem as American as baseball and as logical as the multiplication table to the unthinking and to many who are deceived about the motive of the "liberals." But it is the socialistic state which guarantees real serfdom.

Monetary or political profit is the motive of state socialism. Business men or labor leaders would "share-the-wealth" further than taxes think they will gain special advantage from such a government.

Politicians who favor sovietizing America are looking for the votes, with the hope of guaranteed perpetuation, power and pomp in office.

This is the direction of much thinking here among the bureaucrats. Indeed, President Roosevelt himself has endorsed the report of the defunct National Resources Planning Board which recommended taking over the "basic industries" such as steel, aluminum and magnesium through the issuance of his report on demobilization. The government now owns $25,000,000,000 worth of plants and facilities.

Some business men doubt whether the government could succeed in taking over business because not enough top officials could be gotten to manage them for the government. The government has already overcome this by offering unlimited borrowing power to relatively unknown operators and there are some plans to pit the managerial skill of these men against the skill of large competitors.

The long-haired boys here are planning what the government could do to control all industry through its ownership of what amounts in value to one-fifth of the nation's factories and plants. Deeply pink publications are discussing the problem and writing about what should be done to compensate stockholders should the government decide to expand its holdings.

Aside from any argument, that such proposals are contrary to a Constitutional concept of government, the practicality and efficiency of such action does not disturb the "liberal"

Don't Expect Too Many Bargains, Says Jones

• • • When the war is over, "Government should get out of active industry as soon as it can, without too much unnecessary loss," Jesse H. Jones, Secretary of Commerce, declared Sept. 30 in an address at a dinner in the Hotel Waldorf-Astoria of the New York Board of Trade.

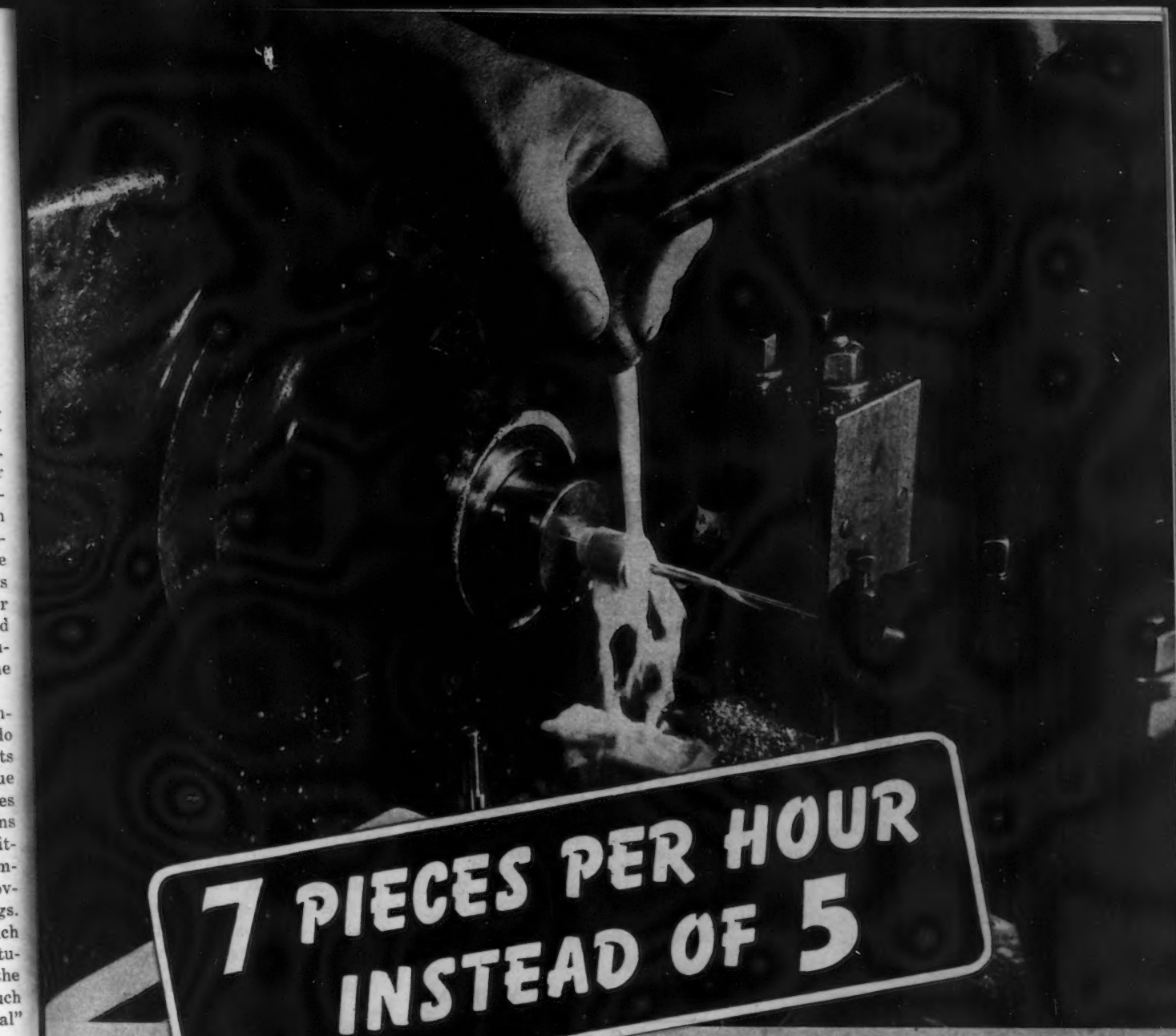
This does not mean, however, that business should look for the end of collaboration with Government in the post-war period, he said. Private initiative alone cannot meet the challenge of reconstruction at home and abroad and "in many instances Government must continue to have a hand in business," he asserted.

"Business will do well," he said, "to recognize the taxpayers' investments, when negotiating for Government-owned plants, properties and supplies, and not expect too many bargains."

The Government's stake in industry, he pointed out, is large.

"In addition to the billions spent by the War and Navy Departments, and the Maritime Commission in building facilities and equipment for war purposes, the Reconstruction Finance Corp. through its subsidiary, Defense Plant Corp., has authorized more than $9,000,000,000 for the construction, equipment or expansion of 1,753 plants throughout the country for the production of war supplies," he said.

. . "These include 534 plants for the manufacture of airplanes, airplane engines and parts; eighty-four plants for the production and fabrication of aluminum, thirty-five plants for the production of aviation gasoline and related products, 116 plants for the manufacture of machine tools, forty plants for the production and fabrication of magnesium, sixty plants for the mining and production of minerals and metal products, seventy-five plants for the manufacture of ordnance equipment, ninety-eight plants for the manufacture of radio and other scientific equipment, sixty-five plants for the construction of ships, ship engines and parts; 164 plants for the production of iron, steel and related products; sixty plants for synthetic rubber and the chemicals and materials necessary to its manufacture, fourteen plants for the manufacture of jewel bearings and diamond dies, forty-three for the production of hemp and rope fiber. We have built six pipelines for the transportation of petroleum products."



SUNOCO EMULSIFYING CUTTING OIL

...boosts cutting tool life 40%...speeds production...improves finish

Here's one plant where vital parts for war machines are being produced in almost half the time it used to take . . . thanks to Sunoco Emulsifying Cutting Oil.

According to reports slow speeds were necessary because of excessive heating and smoking. Tools wore rapidly. Cutting oil costs were high. Then a Sun Doctor of Industry was called in. At his suggestion a switch was made to Sunoco. In one week, results were remarkable. With Sunoco's high heat-absorbing and lubricating qualities, speeds were increased. Seven parts were produced each hour instead of the former five . . . making possible 16 "extras" per day with no increase in tool grinding. Finishes were noticeably finer. And all at a saving of 10% in cutting oil cost.

This is only one of many cases where Sunoco Emulsifying Cutting Oil is speeding the production pace of American industry in its race with War. Probably a similar speed-up can be accomplished in your plant. Call in a Sun Oil Company Engineer—write or phone your local Sun office.

SUN OIL COMPANY, *Philadelphia*

Sun Oil Company, Limited . . . Toronto, Canada

SUNOCO

SUN INDUSTRIAL PRODUCTS

HELPING INDUSTRY HELP AMERICA

planners. Government has always been notoriously inefficient in operation of industry.

THE Post Office, the canals and railroads operated by state governments after the civil war, the federal government's record of waste and extravagance in the operation of the railroads after the last war, the TVA and scores of other government ventures have shown governments have no fear of deficits.

The people will be told again and again that there cannot ever be universal employment without continuous production at war levels after the war. The unlamented NRPB has recommended this.

It will make no difference whether markets are sold beyond the absorption of goods produced. It is planned to distribute the surpluses free to the have-nots. To gain this end it will be necessary to convince the people to accept the demagogic lie that all private business is wicked and unfit for public trust. The inference is that there is a "corner on honesty" among public officials or in management dominated by government. This inference is gilded and made seductive by pap from the Federal Treasury, the prodigal dispenser of the taxpayer's money.

Already, because of the constant repetition of the lie, millions believe it and millions on the overstaffed payroll welcome the indocrination. The super-strategy is geared to take advantage of the coming world economic chaos caused by over-expansion of facilities, over-production of goods and financial insolvency of governments.

POST-WAR Europe will be cited as an example because all Europe has succumbed to one form or another of socialism. Because the English have mixed more government in business than the United States has, and because Britain will in all likelihood go farther than the left after the war, America will be under powerful pressure to follow suit.

While driving against monopoly, the government is planning to become the biggest monopoly on earth. If these schemes are carried to their logical conclusion, there will not be an individual in the United States who does not work directly for the government.

Since private American business has built the mightiest industrial machine in the world, it will be very little trouble for the bureaucrats to succeed in its operation for a while. It may be a half a century before the clock of progress is slowed by the paralysis of bureaucracy, if the voters decide to surrender their rights.

The trend toward state socialism has become so strong that arguments against it will prevail only if private enterprise makes good in meeting the most supreme challenge that it has ever faced. It has to be prepared to show its superiority over government control. To do this it must be ready to effectuate post-war plans to absorb full employment at good wages. To do this it must expand markets to be supplied at reasonable prices.

Congress Busy Again

● ● ● Excerpts from a speech in the House by Congressman Richard J. Welch, Democrat, of California, as quoted in the Congressional Record of Sept. 21:

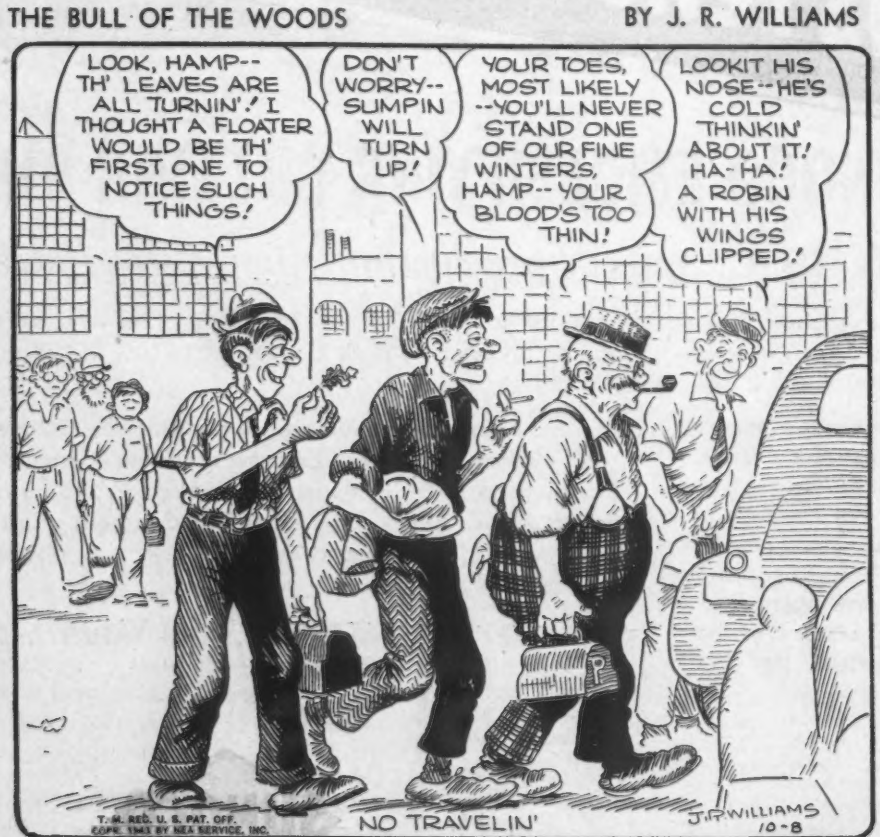
"During Congressional recess I visited every major shipbuilding plant in California . . . A shortage of steel existed at every one of these shipyards . . . The blame should be placed upon the steel masters . . . The over all shortage of steel for necessary war purposes during July, August and September amounts to 6,250,000 tons, which on an annual basis would amount to 25,000,000 tons . . . Only the decentralization of the steel industry in this country will enable us to produce enough steel for our wartime and our peacetime needs."

. . . Quote from radio address by Senator Harry S. Truman, Democrat of Missouri, chairman of the special Senate investigating committee, scheduled for delivery Oct. 4:

"The Committee will disregard newspaper articles and radio programs which confuse the issues and seek to absolve corporations for their failures. The next time you read such an article or hear such a program, I would appreciate it if you would write me. I will send you a copy of the report or the public hearings in question. After you have read them, if you disagree with the Committee, I would appreciate your writing and telling me so. If you disagree with the newspaper or radio commentator, I would appreciate your writing him and telling him so."

● ● ● Statement Oct. 4 in Washington by Senator Tom Connally of Texas: (The Iron and Steel Division of WPB is) "owned and controlled by big industry . . . "They own and control it as much as if they had a deed on the office space . . ." Every man in the iron and steel section is out of some big company and they don't want any more steel."

THE BULL OF THE WOODS — BY J. R. WILLIAMS


LOOK, HAMP-- TH' LEAVES ARE ALL TURNIN'! I THOUGHT A FLOATER WOULD BE TH' FIRST ONE TO NOTICE SUCH THINGS!
DON'T WORRY-- SUMPIN WILL TURN UP!
YOUR TOES, MOST LIKELY --YOU'LL NEVER STAND ONE OF OUR FINE WINTERS, HAMP-- YOUR BLOOD'S TOO THIN!
LOOKIT HIS NOSE--HE'S COLD THINKIN' ABOUT IT! HA-HA! A ROBIN WITH HIS WINGS CLIPPED!
T.M. REG. U. S. PAT. OFF. COPR. 1943 BY NEA SERVICE, INC.
NO TRAVELIN'
J.R.WILLIAMS 10-8

Batcheller Appoints Stevenson As Assistant

Washington

● ● ● **Andrew Stevenson,** who was director of the WPB Transportation Equipment Division, Construction and Utilities Bureau, has been appointed as an executive assistant to Hiland G. Batcheller, Operations Vice Chairman. Lynne L. White, Chief Operations Officer of the Chicago & Northwestern railroad, was named as direction of the Transportation Division.

BLANCHARD

CHECK THESE ADVANTAGES OF BLANCHARD GRINDING

- ★ Production
- Adaptability
- Fixture Saving
- Operation Saving
- Material Saving
- ★ Fine Finish
- ★ Flatness
- Close Limits

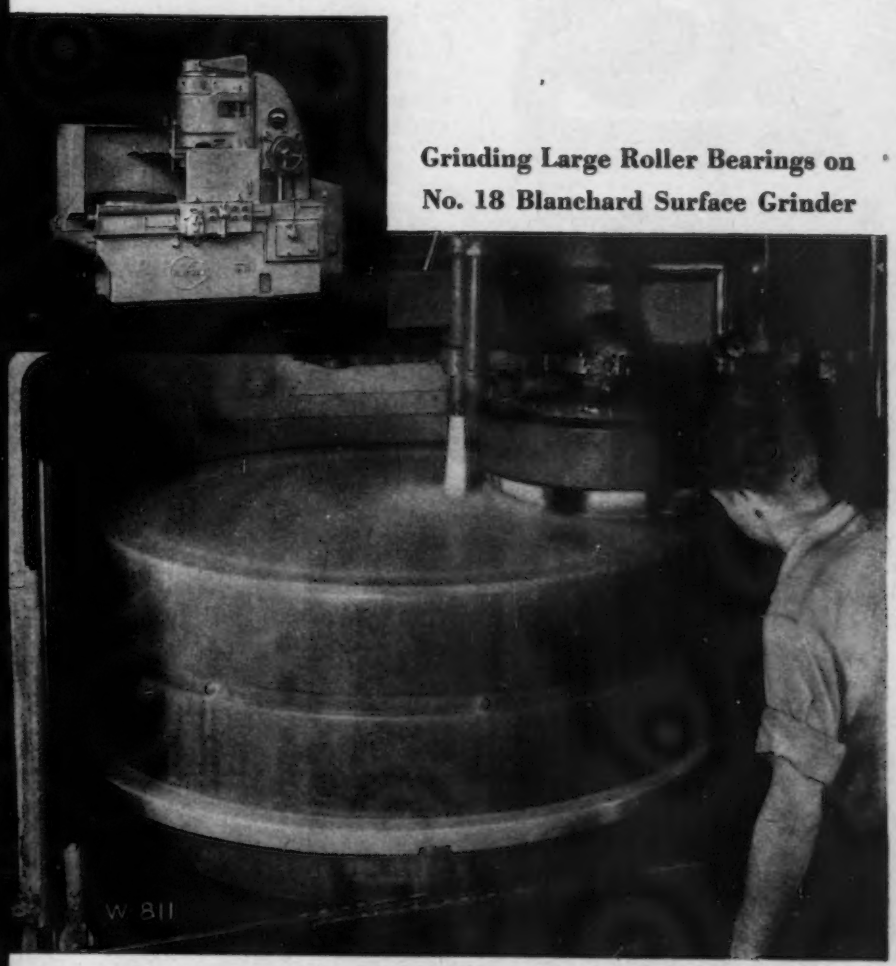
★ . . . . . *Especially valuable on jobs like the one illustrated.*

"PUT IT ON THE BLANCHARD"

The job shown here is another example of large heavy work which may be ground with ease on a Blanchard No. 18 Surface Grinder with extended column and 42" chuck with extension.

These 48" diameter Roller Bearings come to the Blanchard after hardening.

Both sides are ground, removing .050" stock from each side, and size is held to ±.001". The grinding is done in four operations in total time of 4½ hours. Each piece weighs approximately 1800 lbs.



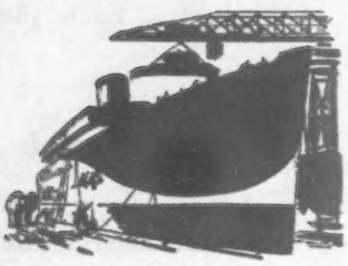
Grinding Large Roller Bearings on No. 18 Blanchard Surface Grinder

Send for your free copy of "Work Done on the Blanchard." This book shows over 100 actual jobs where the Blanchard Principle is earning profits for Blanchard owners.

The BLANCHARD MACHINE COMPANY
64 STATE STREET, CAMBRIDGE, MASS., U. S. A.

WEST COAST . . . OSGOOD MURDOCK

• Little enthusiasm and widespread apprehension toward the Baruch-Byrnes manpower control plan supposed to be in coastwide effect Oct. 15 . . . Management would prefer final, positive authority in a single public agency.



SAN FRANCISCO—No applause, not even a slight clap, has greeted the West Coast sneak preview of the Baruch-Byrnes surprise production "West Coast Manpower Control," the preferred priority project and worker program. Just now the management seems divided whether to send the production back to the cutting room for alteration and possibly retakes, or to blacksnake it on every screen and make 'em love it. At this writing the latter counsel prevails with a universal opening date set for Oct. 15. In the words of C. E. Wilson, WPB's executive vice-chairman who has made two round trips to the Coast in the last 30 days in connection with the grand opening, "This plan has got to work."

Conferences, meetings, statements and pronouncements have been numerous, particularly at Seattle and Los Angeles where mass shortage of aircraft workers draws principal attention. Industrial and labor relations men, both for employers with management and for direct military procurement with the Army, Navy and Maritime Commission, shake their heads and point out that the possible success of the plan depends on two rather large inter-civilian agency committees, with one member each from WPB, WMC, ODT, SWPC, WFA (Agriculture), selective service and congested area representatives.

Both the employer and military people would favor either a rather ruthless single agency with positive, final, unlimited power, or no agency or restrictions or regulations at all, giving management a free hand, with the battle to the strong and resourceful.

Spokesmen for chambers of commerce and Smaller War Plants groups are fearful that contracts will be cancelled to impair later recovery. Organized labor is cool because it was not consulted in formulating the plan and has no representation in the administration. Even War Manpower and WPB, sitting in whatever saddle there is, seem uncomfortable and apprehensive at assuming responsibility and authority.

OUT of this welter of concentrated attention which manpower has attracted these past weeks, significant facts and figures have emerged. In shipbuilding and aircraft, the two major war production industries on the West Coast, there are slightly over 1,000,000 workers, in a three to two ratio favoring shipbuilding. Nearly 16 per cent of all shipbuilding workers are women and 43 per cent of all aircraft workers are women. Of all workers in these two major industries on the West Coast, over 70 per cent are employed in California.

It is now stated that from 30,000 to 50,000 additional workers are needed for aircraft and these need not be skilled or trained; women are now preferred. Production of airplanes on the West Coast must be stepped up at least 25 per cent before the end of the year. In the San Francisco Bay area local Manpower Director James P. Blaisdell declares 100,000 additional workers over-all are needed by Jan. 1 in addition to the present 389,000 workers in "all essential employment."

FROM the Aircraft War Production Council, Inc., representing the big eight West Coast airframe producers (Boeing, Consolidated-Vultee, Douglas, Lockheed, Northrup, North American, Ryan and Vega) comes a manpower analysis of 78 pages with supporting data that presents factual information from the point of view of aircraft management. It is stated that last January the personnel gap between required and actual total personnel was approximately 1300. In June the gap had passed 19,000, a missing labor force equal to the entire productive personnel of a single important plant making approximately 250 fighters and bombers a month. In the first six months of this year 150,435 persons were hired to get a net increase of 20,291. During the first seven months of this year a 44 per cent increase in production was achieved with only a four per cent increase in employment. One company making four-motored bombers is doing with 17 men this year work which required 444 men in 1940. This achievement in labor utilization is properly pointed to as offsetting what appears to be waste of workers in the plant.

The 58,000 aircraft workers vulnerable to selective service by next June include 37 per cent of the entire engineering personnel, 23 per cent of the entire inspection personnel, 24 per cent of the tooling personnel and a high percentage of administrative and factory department superintendents. It is pointed out that numerically the vulnerable aircraft men represent less than two per cent of the total reported armed service requirements between now and next June, yet their loss to Pacific Coast aircraft production would endanger realization of the scheduled production in plants which last year built more than 60 per cent of the nation's airplanes. There are large shortages of mass personnel and numerically smaller but more critical shortages of key personnel.

"Stop turnover, help to provide sufficient incentive, make possible a psychology or morale in plants that permits training new workers and proper foremen and superintendents, grant group deferment to key men including engineers, tooling experts, trained inspection exports, important administrative and factory personnel and we'll produce the planes on schedule," says aircraft management.

PACIFIC CAR & FOUNDRY CO. of Seattle has taken over 53,000 sq. ft. under roof and 250,000 sq. ft. open space in the Fairgrounds at Billings, Montana, 800 miles away

WHEN IT COMES TO *Grinding* WITH ACCURACY

. . consider Ex-Cell-O precision equipment

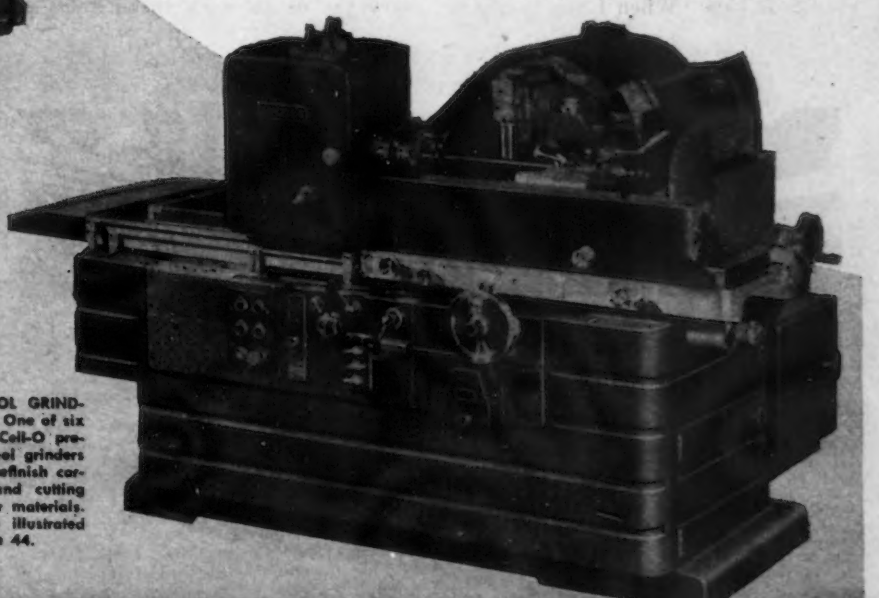
Today's grinding practice brings Ex-Cell-O designed equipment right to the front. Ex-Cell-O precision-made products now entering far into the grinding field have made possible worthwhile improvements in methods to attain mass production with accuracy. There is the Ex-Cell-O thread grinder, introducing commercially a new precision process to American industry; the Ex-Cell-O tool grinder, bringing new efficiency in the grinding of cutting tools of carbide, stellite, and high speed steel; the Ex-Cell-O lapping machines for properly preparing female centers for grinding, and for the rapid precision finishing of small holes; and there is the Ex-Cell-O grinding spindle, widely used by the builders of internal, surface and universal grinding machines, for both original equipment and replacement. In the manufacture of all these products, only one standard exists at Ex-Cell-O—the best that highly trained engineers and skilled workers can produce. *If you have a grinding problem consider the equipment illustrated on these pages—the Ex-Cell-O name on each machine is positive assurance of it being a precision-built product to do a real precision job.*

PRECISION LAPPING MACHINES—(Above) Ex-Cell-O Style 74 for Center Lapping. With smooth, correctly shaped centers on workpieces, readily obtained through the use of this machine, greater precision can be assured when using grinding equipment. *To right:* Ex-Cell-O Style 71 Internal Lapping machine for lower cost precision finishing of plain straight holes and holes with interrupted openings.

Grinding on today's high and steady production basis places a heavy demand on the grinding spindle. It must be one that assures minimum end and radial play, as well as one that develops and maintains all the speed that's required for the job in hand, and accomplishes this for long periods of time without bearing adjustment or replacement. These are the exact features that have made the Ex-Cell-O spindle one of outstanding preference among machine tool builders. The greater accuracy, increased production, and better finish that a large number of industrial firms are obtaining today on machine tools equipped with the Ex-Cell-O Precision Spindle can, to a great extent, be attributed directly to the superior features of the Ex-Cell-O spindle ball bearing. These features include special methods developed and patented by Ex-Cell-O for precision fitting of the ball bearings.

EX-CELL-O CORPORATION • DETROIT

PRECISION THREAD GRINDERS—Ex-Cell-O makes nine styles of precision thread grinding machines, making it possible for each manufacturer of hardened threaded parts to select the exact type of machine required to handle his precision threaded work successfully on a profitable production basis.



CARBIDE TOOL GRINDERS—(*To left*) One of six styles of Ex-Cell-O precision-built tool grinders designed to refinish carbide-tipped and cutting tools of other materials. The machine illustrated is Style 44.

XLO

EX-CELL-O *for* PRECISION

Precision THREAD GRINDING, BORING AND LAPPING MACHINES • TOOL GRINDERS • HYDRAULIC POWER UNITS • GRINDING SPINDLES • BROACHES • CONTINENTAL CUTTING TOOLS • DRILL JIG BUSHINGS • DIESEL FUEL INJECTION EQUIPMENT PURE-PAK CONTAINER MACHINES • R. R. PINS AND BUSHINGS • PRECISION PARTS

from the main plant and across three major mountain ranges. There a plant will be in operation by mid-December, including an assembly line on the M-26 trucktractor for the Army. This leaves the big new Renton plant with its foundry, fabricating and assembly facilities, together with its trained and expert labor force, to be switched over to aircraft or shipbuilding effort in the Puget Sound area.

Kenworthy Motor Truck Corp. is making a similar move of its heavy-duty truck assembly line for Army Ordnance to the Yakima Fairgrounds, across the Cascades in an agricultural area where labor, transportation and housing are not so tight as in Seattle.

To Lend-Lease for trans-Pacific export, 30,000 tons of new California-produced steel ingots were shipped from the Kaiser Fontana mill in August. Among other products which are reported having left the plant are 1950 tons of pig and 1600 tons of coke, along with sizeable quantities of by-product coke oven products.

That the four open hearths are in impressive operating order is evidenced by a further report that in one 24-hr. period a couple of weeks ago, 1868 tons of steel were produced. This was 150 tons better than the best previous record.

o o o

Aircraft Design Simplification Urged

By R. RAYMOND KAY
Southern California Editor

• • • **The simplification** of aircraft design with a view to simplifying maintenance was strongly urged by Major General Delmar H. Dunton, deputy director, Air Service Command, at the SAE National Aircraft Production meeting in Los Angeles, Sept. 30, Oct. 1 and 2.

"I am not telling you anything you didn't already know when I say that we are manufacturing the finest fighting aircraft in the world," he said. "It was a foregone conclusion we should do this. When I say they are good, I am thinking of their terrific punch and of their ability to withstand terrific punishment."

He said one problem which causes considerable difficulty is that, in some instances, the same type of equipment made by different manufacturers is not interchangeable. This has compelled the requisitioning not only by parts number, but by manufacturer as well, in order to insure correct fit.

"Our Air Corps Supply now handles about 380,000 individual items," he said. "If it is going to be necessary for us to stock these items according to manufacturer, it is not difficult to imagine the effect of tripling or quadrupling this number.

But most important of all, according to the general, is the need for simplification of design with a view to simplifying maintenance.

"I have to hand it to the Germans for the simplicity of design of the Me 109," he said. "We have some types, too, which are ingenious in their simplicity and ease of maintenance, but at the same time, we have others that are the crew chief's nightmare."

The size of post-war commercial planes will be set by economic rather than by engineering limits, according to C. L. "Kelly" Johnson, chief research engineer, Lockheed Aircraft Corp., and general chairman of the meeting. He believes that in the first five post-war years economics will limit transocean planes to 100 passengers, and transcontinental planes to 200.

Present and post-war availability of magnesium was reported by J. C. Mathes of the Dow Chemical Co., Midland, Mich. Mr. Mathes told members of the Society that British use of magnesium for warplane gasoline tanks enables them to increase fuel capacity by 12 gal., save 9 lb. in weight, and reduce the "tulipping" of bullet holes which interferes with self-sealing. Magnesium was said to supplement aluminum as a metal helpful in increasing the range, load, speed, and maneuverability of warplanes. Assurance of abundant supply, plus accumulating use and test experience, now makes magnesium available for extrusions, forgings, castings, and sheets.

Mr. Mathes said the use of cast, forged, and extruded magnesium parts has been completely satisfactory, but that overloading and impact have caused some premature failures where thin magnesium sheets have replaced aluminum. Sheet magnesium was reported to have been found satisfactory for oil tanks, wheel fairing, instrument panels, turret parts, and cases, and to permit weight savings ranging from 11 to 26 per cent when used in surfacing aircraft ailerons, flaps, elevators, and tail assemblies.

John Dolza and Harry C. Karcher of Allison Division, General Motors Corp., Indianapolis, Ind., were awarded the 1942 SAE Manly Memorial Medal.

. . . Cited for Awards . . .

• • • **The following companies** have been awarded the Army-Navy "E" Award for outstanding performance in war production.

Marine Basin Co., New York
Carboloy Co., Inc., Detroit
Nash-Kelvinator Corp., Propeller Division, Lansing, Mich.
Hazeltine Electronics Corp., New York
Edwards & Co., Norwalk, Conn. (renewal)
Craftsweld Equipment Corp., Long Island City, N. Y.
Hercules Powder Co., Experiment Station, Wilmington, Del.
Callaway Mills, Manchester Division, Ga., and Milstead Division, Ga.
Ceco Steel Products Corp., Mfg. Division & Auxiliary Plant, Chicago
Clary Multiplier Corp., Los Angeles
Crescent Tool Co., Main Plant, Jamestown, N. Y.
Henry K. Davies Co., Inc., South Kearney Plant, N. J.
Line Material Co., Transformer Division, Zanesville, Ohio
Oklahoma Steel Castings Co., Tulsa, Okla.
Phillips Packing Co., Inc., Cambridge Plant, Md.
S. H. Pomeroy Co., Inc., Bronx Plant, N. Y.
Prentiss Wabers Products Co., Wisconsin Rapids, Wis.
Rudolph Wurlitzer Co., North Tonawanda Plant, N. Y.

Maritime Commission "M"

Edwards & Co., Inc., Norwalk, Conn. (renewal)

Facilities Committee To Restrict Construction

Washington

• • • **A statement of policy**, continuing the restriction of construction to the minimum necessary to the war program and for essential civilian needs, has been adopted by the WPB Production Executive Committee. To carry out this policy, a Facilities Committee was established.

•

Small Lots of Moly Eased for Foundry Users

Washington

• • • **The WPB** issued Supplementary Order M-110-a as amended, to permit the acquisition of 500 lb. or less of molybdenum by foundries to fill authorized controlled materials orders or orders rated AA-5 or higher, without going through allocation proceedings.

Now—A FLUID MOTOR *With Floating Drive*

Today's answer to rotary power needs where shock loads are involved. Write for bulletin FM-200

Denison HydrOILic Fluid Motors are the new answer to shock-load problems and stepless speed-variation needs wherever rotary power is required. Their unique "floating drive" eliminates mechanically-linked or universal-type drive rods — ends distortion or breakage from sudden starts, stops and reversals. Positive contact and pressure drive between the motors' *driving* and *driven* elements prevent destructive backlash or inertia. These motors are self-starting from any stopped position, and fully self-lubricated. Other features include *all standard* commercial bearings; fewer moving parts; all types of mounting arrangements. They deliver maximum efficiency wherever rotating power is indicated — whether transmitted through pulleys, gears, or direct connection — and especially where oil hydraulic power is already installed or contemplated. Get full details on HydrOILic Fluid Motors. Write today for bulletin FM-200! The Denison Engineering Company, 1158 Dublin Road, Columbus 16, Ohio.

HydrOILics
INDUSTRY'S RIGHT HAND

DENISON
EQUIPMENT *in* APPLIED
HydrOILics

Fatigue Cracks

BY A. H. DIX

Amgot Revealed

• • • Kind friends have called upon us in person, have written and telephoned to inform us that AMGOT means "Allied Military Government of Occupied Territory." How convenient, we thought, that the vowels and consonants happen to fall into such order that an easily pronounceable word results, as in the case of DORA, England's Defense of the Realm Act.

We were thinking of suggesting that, in the naming of new organizations, the Government choose names whose initials make words. But that was before we were aware of the danger involved in the promiscuous coinage of words. Leon Wesley Moffett, your Washington editor, tells us it has just been discovered that AMGOT is Turkish for something unprintable and almost unspeakable. So, for decency's sake, it has been cut down to AMG. We can't even hint at what AMGOT means, as we don't know. Moff was afraid to send the definition through the mails, but said he will tell us the next time we are in his city.

Twin Lowells

• • • We are, however, able to pass along this postscript on Moff's note:

The head of the Redistribution and Salvage Section of the Ordnance Department is Lt. Col. Lowell Thomas. No kin to Lowell (Sunoco) Thomas.

Aptronym

The superintendent of the International Harvester Company's printing department in Chicago is a Mr. Plough.
—*Osgood Murdock*

We Learn the Bazooka

• • • We view the brains department's surefooted tread through the maze of wartime censorship with a mixture of awe and admiration, plus a jigger of envy. As a loving and constant reader you have noticed, of course, that your favorite family journal is practically always first with the news of new developments.

This is due mainly to legwork, but another important factor is a nice sense of timing. If an editor is overcautious, because of timidity or lack of knowledge of what the censors regard as "hot" at a particular moment, his publication is pallid. If, on the other hand, he habitually over-reaches due to rashness or ignorance, his knuckles are bloodied so often that he soon develops a reflex which causes him to throw up his guard when confronted with even an innocuous bit of news.

Timing is as important to an editor as it is to Sam Snead or Gruen. And especially so in wartime. What was too hot to handle yesterday may be picked up safely today. We are painfully conscious of this, as a recent instance revealed that this page's timing is badly out of whack. It has to do with the bazooka, the widely heralded tank-buster. As early as last spring, before a word about it appeared in print, we not only saw it fired, but we actually handled the projectile itself. We could have scooped the world, but so well did we keep our secret that we have been scooped by all, not excepting the *Eastern Star Quarterly*.

It was at the Aberdeen Proving Ground that we saw the bazooka in action. The time was about last March. The occasion was a pilgrimage to the Proving Ground by a group of technical and lay journalists. The authorities would not let us use our camera, and time has clouded our impressions, but as we recall it we were first permitted to see the bazooka fire its missile into Chesapeake Bay. It was then aimed at a piece of heavy steel plate, but for a reason still unknown to us we were not allowed to see it hit the plate. We had to stand in back of a concrete wall and observe the impact through a small mirror. As there was only one mirror —about the size of this page—and there were about sixty of us, no one saw what happened, which is probably what the Aberdeen people intended.

We were allowed to inspect the damage done to the plate by the projectile. It made a nice, clean hole of about ½-in. dia. This puzzled us, as the rocket itself is about 3 in. in diameter. We asked a major general about it, but while he was very enthusiastic about the bazooka, we found him capable of great silences.

We asked the soldier who fired the bazooka whether it was hard to handle. He said it wasn't, and that the kick is no more than you get from a .22, which is understandable when you consider that the projectile goes through the air hardly any faster than a lobbed tennis ball, and furthermore, being a rocket, travels on its own power, instead of using the firing tube as a springboard.

After harboring the secret of the bazooka in our breast for seven months we are glad to get rid of it, even though we have been scooped, as we said, by all including the *Eastern Star Quarterly*.

Back to Webster

• • • Next to the bazooka our other most vivid recollection of our day at Aberdeen is that the word "manhandled" does not mean the same thing to Ordnance people that it does to us. When an officer said, "This gun can be manhandled," we thought he meant that it would withstand considerable kicking around. Later we found that in the Army "manhandle" means simply "capable of being handled by hand."

Color Line Avoider

• • • The same word can, of course, mean totally different things to different people. Frank Irving Fletcher, one of the country's highest priced advertising writers, tells of a client who objected to the phrase "niggardly buying power" on the grounds that it might arouse suspicion of racial prejudice.

Stopper

• • • What part did machine tools play in solving this murder?—*Bryant Chucking Grinder Co.*

Throw a needle through a haystack?—Oilgear Co.

Two Souls with But . . .

• • • A caption coincidence in the Aug. 26 issue is marked by V. H. Kildahl, of the W. H. Hobbs Supply Co., Eau Claire, Wis. The New Britain Machine Co. headlines its front cover adv., "*The Shape of Things to Come. . . .*" and thirteen pages later on the Union Steel Castings Division of Blaw-Knox asks "*Who knows the Shape of Things to Come?*"

Puzzles

Last week's ceiling is 11.2 ft. high.

We have always had a yen for the metaphysical type of problem, like the one about the wise man who was chosen to marry the sultan's daughter because by pure logic he reasoned that he had a cross on his forehead. We are, therefore, glad to present this one sent in by James T. Gordon, although we haven't the slightest idea what the answer is, even though we pass the 14th St. station twice a day:

A semi-retired merchant, living on East 12th St., New York, owns two stores, one located on Wall St. and the other on 42nd St. It is his custom to visit each store once a day, five times a week—Monday through Friday.

After a late breakfast he saunters over to the subway station at 14th St. He has no set schedule, but usually arrives there between 9 and 10 o'clock. He goes to the express platform, where on one side the trains run uptown toward 42nd St., and the other downtown toward Wall St. The number of trains per hour arriving here in each direction is equal. The merchant is not particular which store he visits first. He simply takes the first train that comes along.

The peculiar thing is that 80 per cent of the time he goes downtown. Why?

Stop AT THE LINDBERG PLANT

. . . during your visit to the National Metals Congress at the Palmer House in Chicago, October 18 through the 22nd. We will be pleased to greet you in Room 765 at the Palmer House and conveniently arrange your trip to the plant.

★ A cordial invitation is extended to all our friends to see the step by step construction of many sizes and types of Cyclone, Super-Cyclone and Hydryzing furnaces as they move through the shop ★ The new line of Laboratory furnaces and equipment, recently announced, will be on display for your examination. You will find them different and interesting ★ Too, Lindberg's famous Input Control and Throttling Control are here for those who wish to see their operation and advantages.

There is more to see and a lot to talk about—we will be looking forward to seeing you the week of October 18—Room 765, Palmer House, Chicago.

LINDBERG ENGINEERING COMPANY
2452 WEST HUBBARD STREET, CHICAGO 12, ILL.

ARMY E NAVY

LINDBERG FURNACES

SUPER-CYCLONE for hardening, normalizing, annealing, tempering

CYCLONE for accurate, low-cost tempering and nitriding

HYDRYZING for scale-free and decarb-free hardening

Dear Editor:

CENTRIFUGAL CASTINGS

Sir:

Centrifugal casting practice has interested us for a number of years. Your Sept. 23 "News Front," regarding experiments with green sand molds for centrifugal castings is of special interest to the Yard. It would therefore be appreciated if data concerning this new technique could be made available.

With continued interest in your fine technical articles,

UNITED STATES NAVY YARD
(The address of the Navy Yard is withheld upon request)

● Work with green sand molds is still in an experimental stage. We are not yet at liberty to reveal the identity of the plant. We will give further information as soon as it may be published.—Ed.

CMP-PRIORITY GUIDE

Sir:

I wonder if you would be kind enough to send me the latest CMP and Priorities Guide? This guide would greatly help me in my work, and I would appreciate it very much if you could forward for my atttention just one copy.

J. W. FAUL
Sears, Roebuck & Co.,
Philadelphia

● The last CMP-Priority Guide we issued was a supplement to our issue of April 29. A copy of it is being sent you.—Ed.

CUTTING TOOL REPORT

Sir:

We have learned that you have a cutting tool report, and would like to know what the charge would be for six, as we would like to distribute them among machine tool operators throughout our various plants.

R. L. HUNTER
Fairchild Aircraft Div.,
Fairchild Engine & Aircraft Corp.,
Hagerstown, Md.

● The cutting tool report is a 64-page booklet entitled, "How To Get Maximum Output From Your Cutting Tools." It is a reprint of articles published recently in The Iron Age dealing with tool tipping, tool grinding for longer life, reclaiming broken tools, chromium plating of cutting tools, and other means of attaining tool longevity. Price is 60c a copy.—Ed.

PUNCH AND DIE DESIGN

Sir:

What books do you recommend on punch and die design?

EUGENE BOGERT,
President
Bogert & Carlough Co.,
Paterson, N. J.

● "Die Engineering Layouts and Formulas," C. W. Hinman, $5; "Press Working of Metals," C. W. Hinman, $4; "Practical Die Design & Die Making," Marshall, $2; all published by McGraw-Hill Book Co., 330 W. 42nd St., New York; and "Punches, Dies and Tools," Woodworth, about $5, Norman W. Henley Publishing Co., 17 W. 45th St., New York.—Ed.

BOUND VOLUMES

Sir:

I maintain a file of your entire technical section. Is it possible to supply me with this section of the Jan. 7 issue, so that I may complete my Vol. 151? Incidentally, have you a binding offer to your subscribers?

S. B. KNUTSON,
Chief Metallurgist
McQuay-Norris Mfg. Co.,
3014 Siemers Lane,
St. Louis

● Prices for binding per volume (a half-year's copies) are $3.50 for buckram, $5.25 for half morocco. Subscriber pays for transportation charges both ways. Copies should be shipped direct to our binder, Spink & Gaborc, 24 E. 13th St., New York, but most of the larger cities have binderies that will do the work for about these prices, in which case transportation costs are less. —Ed.

LEAF SPRING LANDING GEAR

Sir:

We have noted with considerable interest your item on "Leaf Spring Landing Gear," Sept. 16 issue, page 64. Can you give us any further information on this?

HORACE C. KNERR,
President
Metlab Co.,
1900 E. Mermaid Lane,
Philadelphia 18

● We suggest you get in touch with the Leaf Spring Institute, 7310 Woodward Ave., Detroit 2.—Ed.

SILVER ALLOY BRAZING

Sir:

We are much interested in your Sept. 23 article on silver alloy brazing. We would like further information on the manufacturers and suppliers of the various types of burners described.

ERLE I. SHOBERT II
Stackpole Carbon Co.,
St. Marys, Pa.

● Selas Co., D St. and Erie Ave., Philadelphia, manufactures and distributes all the burners mentioned in the article. Further information may be obtained from Harry Smith, Jr., manager of Selas' technical information department.—Ed.

MAHR FURNACE

Sir:

Who makes the Mahr Annealing Furnace, and what is the address?

A. G. WIGGLESWORTH
Wigglesworth Machinery Co.,
199 Bent St.,
Cambridge, Mass.

● Mahr Mfg. Co., Minneapolis, Minn.—Ed.

STEEL INCLUSIONS

Sir:

We are interested in further information in respect to the modification of Fitterer's method for inclusions in steel, as described by A. G. Arend in "British Steel Maker," 1943, Vol. 9, p. 32-35. This is mentioned on page 56 of your May 6, 1943, issue.

Please advise if photostat or reprint copies are available.

D. A. RUSSELL,
Chief Chemist
Youngstown Sheet & Tube Co.,
Youngstown, Ohio

● We have not a complete copy of Vol. 9 of "British Steel Making." However, the Engineering Library, 29 W. 39th St., New York City, has a comprehensive file of engineering publications, and furnishes photostats at a nominal charge.—Ed.

DIRECT STEEL

Sir:

Your Aug. 19 "News Front" mentions a new electrical method for producing steel directly from raw materials, developed in Sweden. Is there any source of further details on this process?

S. M. MARSHALL
1915 Mills Tower,
San Francisco

● Page 56 of the Sept. 2 issue gives more information. The War Production Board recently obtained considerable data on the process and this may soon be available.—Ed.

ANNEALING SERIES

Sir:

We would like two copies of the series "The Annealing of Steel," by Peter Payson of Crucible Steel. If there is any charge, kindly advise and we will remit.

D. A. WILSON,
General Purchasing Agent
Canadian Westinghouse Co., Ltd.,
Hamilton, Canada

● The series has been reprinted by the Crucible Steel Co. of America, 405 Lexington Ave., New York, in pocket-size booklet form. Copies can be obtained direct from Crucible Steel, $1 each.—Ed.

INVENTORY CONTROL

Sir:

The Sept. 16 article by Eugene Caldwell, "What Executives Should Know About Purchasing Control," contains a reference to the same author's "What the Executive Should Know About Inventory Control," published in your Aug. 11 and 18, 1938, issues. Can you tell us how these may be obtained?

CONSOLIDATED IRON STEEL MFG. CO.
299 Madison Ave.,
New York

● We have no copies left. A dealer in back numbers of publications might be able to supply them. Try H. A. Wilson & Co., 960 University Ave., Bronx, N. Y. If unsuccessful, let us know and we will supply you with photostats at 50c a page.—Ed.

THE IRON HORSE GETS A MANICURE

FLUES are the subject of careful attention every time a locomotive goes into the shop for heavy repairs, and are periodically removed from the boiler for thorough cleaning and inspection. In the locomotive boiler, flues carry hot gases from the fire box to the smoke stack, heating the boiler water that surrounds them. They range from 2 to 5½ inches in diameter, and in lengths from 11½ to 24 feet.

Minerals in the boiler water, primarily calcium and magnesium salts, form a heavy crust or scale on the outside of the flues, providing undesirable insulation between the hot gases and the water being heated.

Wheelabrator Cabinet Used

It has been almost universal practice to clean locomotive boiler flues by tumbling in long barrels. Excessive length of the tubing made more advanced methods of blast cleaning impractical before a Wheelabrator cabinet was designed to meet the Erie Railroad's requirements by American Foundry Equipment Company engineers.

Wet tumbling of Erie flues resulted in numerous bent and damaged flues, it was slow and cumbersome, very noisy, and required considerable labor—all factors that led to investigation of the Wheelabrator airless method of blast cleaning.

The Cleaning Operation

The Wheelabrator special cabinet contains one airless blast unit that throws abrasive upon the flues as they pass below it one at a time. The tubing is rotated as it passes under the blast. Speed of the passing flue can be regulated between eight and 29 feet a minute, the speed used on a given batch depending upon the amount of scale to be removed and its hardness.

75,000 Flues Handled Annually

Erie normally removes, repairs and reapplies approximately 75,000 flues annually. This work was formerly handled at both the Hornell, N. Y., shops and at Meadville, Pa., but the new modern shop designed for this purpose at Hornell has resulted in concentration of all flue cleaning operations at that point.

American
FOUNDRY EQUIPMENT CO.
510 SOUTH BYRKIT STREET MISHAWAKA, INDIANA

World's Largest Builders of Airless Blast Equipment

This Industrial Week . . .

- ***Flat Rolled Steel Jam More Intense***
- ***Electric Furnace Problem Significant***
- ***Scrap Campaign's Need Is Indicated***
- ***Ingot Production Remains at 100 Per Cent***

HIGHLIGHTS of steel markets this week include intensification of the jam surrounding flat rolled steel and widespread appraisement of the electric furnace alloy steel problem. There were also such developments as the freezing of more mill schedules by the WPB and the announcement that one company is processing brass slabs upon its steel rolling mills. Meanwhile, steel ingot production this week remained at the 100 per cent mark, all-time peak from the standpoint of tonnage output.

Because of the great volume of orders for sheets, plates and other types of flat rolled steel, WPB will permit steel companies to accept more plate and sheet tonnage than they had been permitted previously to book under CMP regulations. Obviously, the current tight situation will prevent the rolling of all the added tonnage and the result may be a carryover of orders at the end of this quarter.

Up to last week practically all plate mills and continuous sheet units had received record breaking directives for production. The amount of outstanding tonnage which was being offered to mills but which could not be fitted into schedules was somewhere in the vicinity of 200,000 tons.

To those who claimed that the WPB's new action confirmed the presence of a menacing crack in the CMP dyke, officials of the WPB Steel Division at Washington asserted emphatically: There is no discoverable shortage of sheets and plates among consumers, cancellations will take care of the over-order to a large extent (one cancellation of 30,000 tons of plates was entered last Saturday), the carryover at most will amount to about one-half a week's rolling in January and probably will not be as high as the unrolled orders for steel bars.

TIN plate has been cut back to make room for more plates, while sheet requirements for overseas container plants have been slashed sharply (one project alone was reduced from 75,000 to 15,000 tons for fourth quarter). Probably Lend-Lease tonnages will be cut during first quarter, and some help will be received early next year when new plate mills start operating. However, a critical situation faces certain consumers, notably those producing steel shipping drums, in the next three months. Inquiries are being received for the amplified amphibian truck program. Steel companies do not see how this tonnage, an important share of which is in sheets, can be delivered in the next two quarters, unless directives are ordered by Washington.

Will all the present orders held by steel companies actually materialize into shipments? Steel executives, pointing to the constant revisions in military needs which have occurred in the past, doubt that they will. Particularly liable to change or withdrawal are the specifications for delivery six or nine months in the future, which have been placed freely recently. (A sidelight on extended buying is the revelation that large steel buyers have been seeking to reserve substantial tonnages for use after the war ends.)

Perhaps the most absorbing problem of the steel industry is that presented by electric furnace alloy steel. It may be a preview of difficulties which will arise later in other fields as a result of wartime transformations.

This is a situation where demand for alloy steel was so intense that all possible production facilities were switched to make it, and much new melting capacity was built. Some open hearth operators went into the production of alloy steel, added auxiliary equipment and now naturally are loath to stop producing the higher quality and higher priced steel. Consumers, beseeched to use open hearth alloy steel, finally made the change and in some cases found it highly suitable and less costly. Now they are loath to switch back.

INSTRUCTIONS were reported to have been received last week by a few armament producers ordering them to shift certain of their alloy steel requirements from open hearths to electric furnaces. All producers involved are makers of ordnance requirements—shot and shell. Seasoned steel executives expect that all added or "excess" electric furnace capacity will be pretty well taken up before long. They are more concerned about getting better scrap than anything else.

Gradually WPB has been tightening its restrictions on steel company operations and assuming control over more details. On plates, sheets and alloy steels schedules are frozen, with WPB alone given the power of filling holes created by cancellations.

Last week it was disclosed that Weirton Steel Co. is now successfully rolling brass slabs on regular steel mill equipment. Asked to assist, the steel company experimented starting last March, with the result that brass slabs are being hot rolled on a structural mill, cold rolled on a tandem cold mill, slit, annealed, pickled

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inspected and sent on their way for shell cases. The company worked out its own technique. Close to 50 million pounds of brass a month can be processed at Weirton, it is said.

Carnegie-Illinois Steel Corp. has confirmed reports that the finishing end of the Armor Plate Division, Gary Works, will further decrease operations this week, releasing to other departments from 160 to 200 employees. Doubtless the workers will be absorbed eagerly. Despite continued operations close to capacity, steel mills appear to be fighting a losing battle to retain labor. In at least one important mill in the Chicago area, separations over the past three months exceeded hirings.

REPORTS of the Lake Superior Iron Ore Association on iron ore shipments downlake during September show a drop from August shipments, but the ore movement is still relatively high. Shipments in September were 12,742,821 gross tons, 12,677,986 tons of which came to United States ports. During August, shipments totaled 13,976,770 gross tons, the highest in history, with 13,909,891 tons coming to U. S. ports.

Total shipments for the year to date have been 65,102,295 gross tons, or about 7,339,158 tons less than shipments to Oct. 1, 1942. The loss in shipments this year was accounted for mainly by the very late opening of shipping in the Spring. Now, the regular Fall change in vessel draft limits is reported to be in effect.

An important meeting was scheduled to be held on Wednesday this week in Washington on the subject of iron ore prices, which are likely to be adjusted upward. The meeting is important also because of its bearing on pig iron prices.

On the West Coast, an OPA investigation of steel castings prices is reported under way. There was a 25 per cent roll back on these prices and OPA says there is a possibility of a further roll back because of operating economies and higher production.

MERCHANT ship production for the month of September was disappointing, according to Rear Admiral H. L. Vickery of the Maritime Commission. The 160 vessels delivered into service "only equalled our June production figures," he said. On Tuesday this week it was said in Washington that September aircraft production lagged close to the August output of 7612 warplanes and possibly would be found to have fallen slightly below that figure. Model changes and the manpower shortage may be the leading causes. One aircraft company has abolished its third shift at one of its plants.

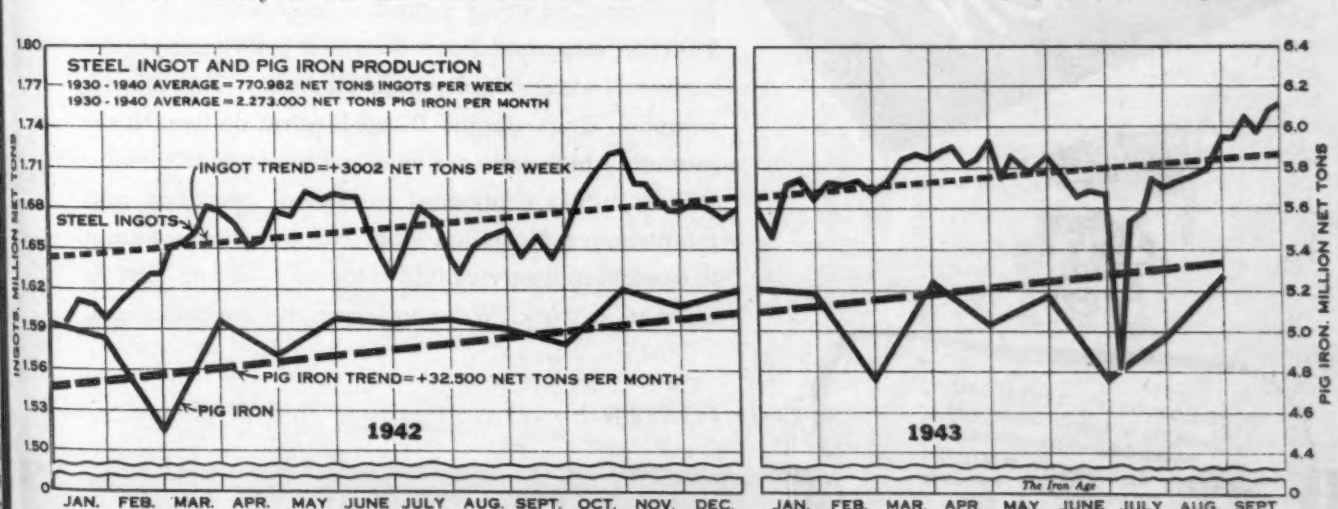
With the start of the national scrap campaign, arguments continue as to whether the scrap situation throughout the nation is really serious. Total consumption during the past five months definitely has been higher than in the preceding five months. Inventory figures, which do not disclose the maldistribution of supplies, have been edging downward. The real need for a successful campaign is apparent.

H. G. Batcheller, WPB operations vice-chairman, last week ordered all industry divisions to cut paper work 40 per cent by relaxing restrictions of certain WPB regulations. Mr. Batcheller's order came after the chiefs of WPB industry divisions had vociferously objected to the institution of the new industrial procedure under the Coordinated Authorization Procedure. This plan would have put non-controlled materials on a single form, thus doing away with various allocation methods now employed by industry divisions.

Prices Set f.o.b. Pacific Coast

San Francisco

• • • OPA has established the following prices on steel for sale by Pacific Coast mills: Rerolling ingots, $31 per gross ton f.o.b. mills; forging quality ingots, $48 per gross ton f.o.b. Pacific Coast ports; rerolling billets, $46 per gross ton f.o.b. Pacific ports; forging billets, $52 per gross ton f.o.b. Pacific ports. The latter three prices represent the Eastern bases plus freight. As previously revealed, the Kaiser Co. was given permission to sell ingots for Lend-Lease at $43 per ton fo.b. Pacific Coast ports.

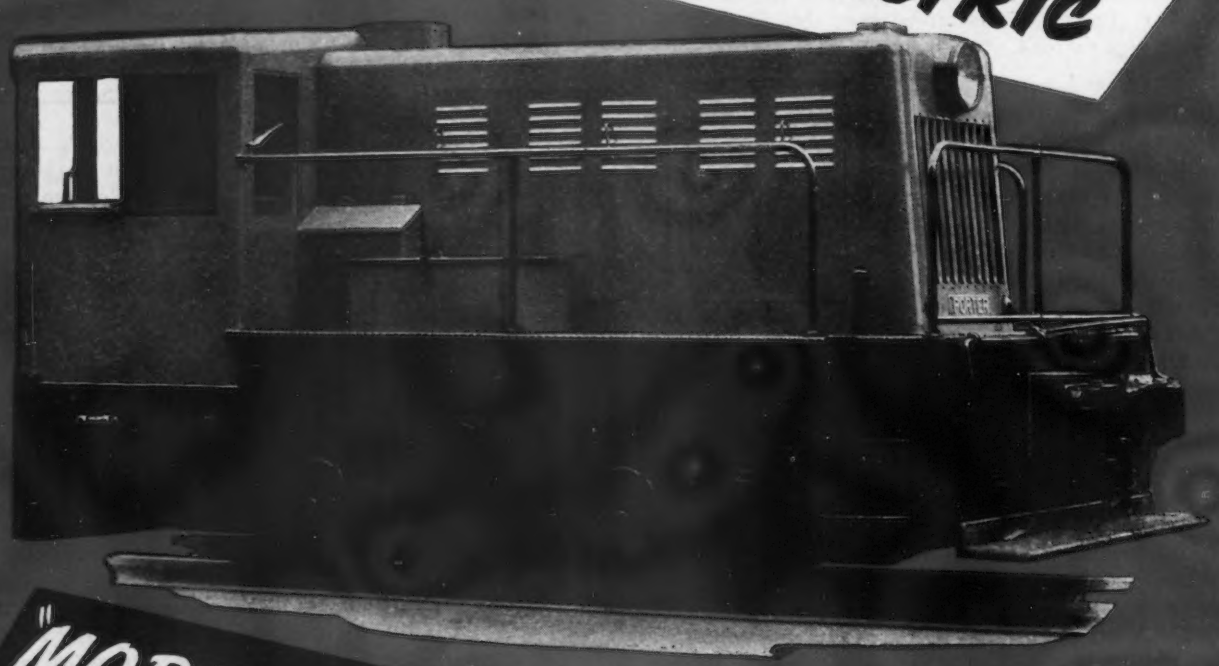


Steel Ingot Production by Districts and Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
September 30...	102.0	100.0	97.5*	93.5	98.5*	104.5	103.0	102.0	98.0	95.0	103.0	106.5	93.0	99.5
October 7.....	102.5	99.5	99.0	94.5	98.5	104.5	103.0	98.5	102.5	95.0	105.0	106.5	96.5	100.0

* Revised.

PORTER 35 TON DIESEL-ELECTRIC



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By eliminating every pound of unnecessary weight, PORTER engineers have designed a switching locomotive of exceptionally high efficiency. This sturdy, compact, single-engine Diesel-Electric delivers a remarkably high ratio of power per ton of dead weight, with resulting economies in cost of operation and maintenance. Unskilled labor can quickly be taught to operate and service this 35-ton unit—it's as easy to drive as a truck! Write for complete specifications.

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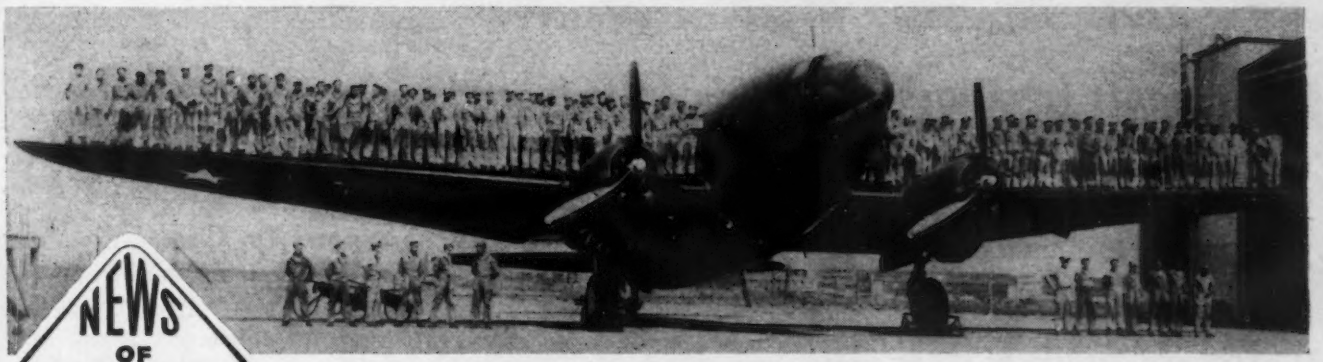


NEWS OF INDUSTRY

Heavy Orders for Flat Rolled Steel May Force Excess Bookings But WPB Says Fears Are Needless

Pittsburgh

• • • **The tight** situation surrounding flat rolled products in the steel industry has now reached a dramatic point where it will keep the iron and steel division of the WPB very busy. Due to the flood of orders, WPB has decided to allow steel companies to accept more plate and sheet tonnage than the allowable 110 per cent of the WPB monthly product production directive.

Heretofore, all mills have been allowed to accept business for a specific product up to 110 per cent of the WPB product directive, which itself was approximately 95 per cent of the mill's practical capacity. This meant that by accepting 110 per cent the mill would have to run approximately at 105 per cent of capacity in a month in order not to have carryovers. The latest plan, perhaps the result of pressure placed upon WPB by the Maritime and the armed forces, certainly forecasts an increase in carryovers during the next several months.

The WPB in recent weeks has attempted to control the plate and sheet situation by freezing fourth quarter schedules and dictating how concellations should be replaced. However, the amount of unplaced plate and sheet tonnage for the fourth quarter grew very large, and the pressure increased. It is understood that as of late last week more than 200,000 tons of plates and sheets for the fourth quarter had not found a "home." Probably, most of this tonnage will find its way on steel mill order books at the expense of raising the allowable 110 per cent acceptance rate. It is doubtful, however, if this will be any more than a juggling of figures.

Up to last week, practically all plate mills had received higher steel plate directives than at any time since the war began, and the same conditions likewise were true of the continuous wide strip mills. Meanwhile, howls have been going up from sheet consumers who got their orders and allotment numbers in, but found the orders back in their own laps because continuous mills must use the space for plates.

While no one in or out of the steel industry will think of attempting to place any blame on any group or person or agency, the fact remains that if the flat rolled situation gets any worse it may endanger and neutralize the beneficial effects of the Controlled Materials Plan. The steel tonnages now on order for steel plates and sheets are so heavy that no safety factor is apparent for breakdowns, manpower shortages, or lack of raw material. Apparently reliance has been placed upon the possibility that certain plate mills, now under construction, will be in operation according to a schedule which some realists already have discarded.

It seems certain that the steel industry and the WPB will have to exercise great patience and restraint in order to put out the maximum tonnage of plates and sheets. This is just another way of saying that the steel distribution picture now faces the greatest hurdle of any time since the war began.

o o o

WPB Counting upon Cancellations

Washington

• • • **High WPB Steel Division** officials labeled foolish industry concern over the present flat-rolled situation in the steel industry.

There is no discoverable shortage of sheets and plates among consumers, it was said at the WPB Steel Division. The reason for putting orders in excess of 105 per cent of capacity (110 per cent of the directive) is to satisfy the desire of claimant agencies to get their orders on producers' books.

While admitting that it may be necessary to enter excess orders on the books of plate and sheet producers, officials say that cancellations will take care of the over-ordering to a large extent.

Last Saturday one agency entered a cancellation of 30,000 tons of plate in this quarter and even if the excess orders in plates amount to 200,000 tons and in sheets to 100,000 tons this quarter, it does not seriously threaten CMP operation.

It was declared that the carryover of this entire tonnage would only amount to about one-half a week's rolling in January.

The British Iron and Steel Control permits as great a carryover as six weeks in some products, it was asserted. It was also said that no complaint has been made about bars but that the carryover on bars proportionately would be much higher percentage wise than in plates and sheets if there is a carryover of an additional 300,000 tons.

Officials expect, however, that the over-orders in plates will amount to only 100,000 tons and in sheets from 50,000 to 60,000 tons.

WORLD'S LARGEST TWIN: More than 100 AAFTC mechanics stand on the wings of the Curtisss Commando, the largest twin-engined airplane. Known as the C-46, it is used to transport men, equipment and supplies into the war zones.

Allotments for Class A Equipment Cleared

Washington

• • • **Where controlled** materials allotments are needed by persons seeking to buy Class A capital equipment from manufacturers, and the allotment cannot be secured under the provisions of CMP Regulation No. 6, applications may be filed on Form WPB-541.

CMP-Priorities developments also appear on pages 101, 116, 118, 120.

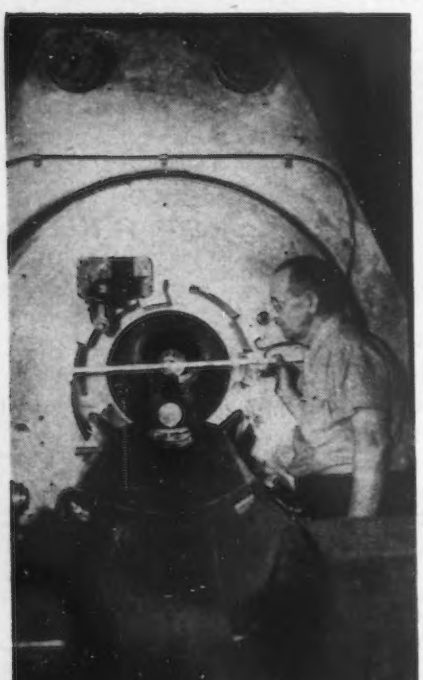
This new procedure was outlined in Direction 34 to CMP Regulation No. 1. Form WPB-541 should be filed with WPB here.

Before application is filed, the buyer should have the machinery or equipment manufacturer fill out a Form CMP-4A, applications for allotment of controlled materials necessary to manufacture the equipment. CMP-4-A, in duplicate, should be filed with WPB-541.

When such applications are approved, the WPB will (1) assign a rating for the purchase of the facility and (2) make an allotment of the controlled materials necessary for its manufacture. The allotment will be sent to the purchaser of the fcily on Form CMPL-150, and he in turn, must make an allotment to the manufacturer on Form CMPL-150A. The purchaser will use the preference rating assigned on Form CMPL-150 in placing the order. The letter transmitting the CMPL-150 will explain how the person wishing to buy the facility places his order and handles the allotment.

The manufacturer may then use the allotment and extend the preference rating to purchase controlled materials, Class A and Class B products, and other materials which he will require as production materials for the manufacture of the facility. The manufacturer must accept the order for the facility or reject it in conformity with Paragraph (p) of CMP Regulation No. 1. If he is compelled to reject the order, the purchaser may then place an order for the facility with any other manufacturer he may choose. An allotment of controlled materials may be made to the manufacturer who accepts the order without any further approval of WPB.

If a producer needs an allotment of controlled materials for a Class A facility which he is going to manufacture himself and he may not obtain the allotment under CMP Regulation No. 6, he may follow the same procedure and use the allotment and preference rating which he receives to obtain any products or materials required to manufacture the item.



READY TO GO! At the left an assembly foreman at Wellman Engineering Co., Akron, Ohio, shows the 16 in. gun's bore with the breech open and loading trough in position. Shells are brought up to position mechanically by an electric hoist and automatically rammed into the gun. Below, the tremendous size of the Barbette Carriage required to hold the 16 in. gun is shown. The two cast steel plates forming the main blocks on which the gun rests weighs upwards of 20 tons apiece.

Salvaged Tin Cans Again Sought by WPB

• • • **Donald M. Nelson,** Chairman of the War Production Board, calling for a greatly intensified nationwide drive to provide 400,000,000 used tin cans monthly for war production, has asked America to salvage at least twice the number of tin cans currently being collected.

Mr. Nelson said, "Tin cans have become a vitally important factor in the production of three of our most urgently needed metals. They provide not only pure tin, but large quantities of steel scrap; while in the Far West tin cans are used to recover copper from mine waters.

"Steel mills are depending upon detinned cars to supply steel scrap. Ninety-nine per cent of every tin can is steel and American kitchens will use in one year enough steel in tin cans to make 22,900 medium tanks or 900 destroyers."

Revocation Recommended Cutting Tool Order E-2-b

Washington

• • • **Revocation of General** Preference Order E-2-b, governing production and distribution of cutting tools was recommended by the WPB Advisory Committee for that industry at a meeting held last week. The committee members expressed the opinion that the cutting tools industry henceforth should be governed only by the provisions of Priorities Regulation 1 and other WPB general regulations.

•

OPA Eases Casting Prices

Washington

• • • **OPA is going to let** gray iron castings prices reflect over-time costs. At the same time OPA on Tuesday said that adjustment of prices of malleable iron castings could be made where the maximum price is not sufficient to warant continuance of casting production.

The most important of the changes on gray iron castings which was contained in Amendment 6 to Price Regulation 244 is permission granted to producers to add the costs of over-time.

Seven New Zones Complete Nation's Steel Warehouse Pricing System Nov. 1

Washington

• • • **Establishment of dollars-and-cents** ceiling prices for heavy steel products sold by warehouses in seven newly created pricing zones in the South and on the Pacific Coast was announced on Tuesday by OPA in Amendment 18 to Price Schedule 49, effective Nov. 1.

Coincidentally, OPA set up a specific basis for computing maximum delivered prices on iron and steel products sold by warehouses and shipped to points not served by rail carriers in Amendment 19 to Price Schedule 49.

The new zones are as follows: —the entire states of Alabama, Florida, Georgia, Louisiana, Mississippi, South Carolina and Tennessee and 24 counties in North Carolina; 12—Texas; 13—Arizona, New Mexico, plus 11 counties in California and four counties in Nevada; 14—47 counties in California, six in Nevada and one in Oregon; 15—35 counties in Oregon and five in Washington; 16—34 counties in Washington and 10 in Idaho; 17—Utah, 34 counties in Idaho, seven counties in Nevada and five counties in Wyoming. These five counties in Wyoming were previously included in Zone 6 established by Amendment 16.

Warehousemen, no matter where located, have only to turn to the maximum price list provided by OPA to discover the exact ceiling price of any heavy steel products. The seven new zones, together with their ceiling prices, were drawn after consultation of OPA with members of the warehousing industry in each marketing area.

Wright Aero Correcting Practices, Truman Says

Shenandoah, Iowa

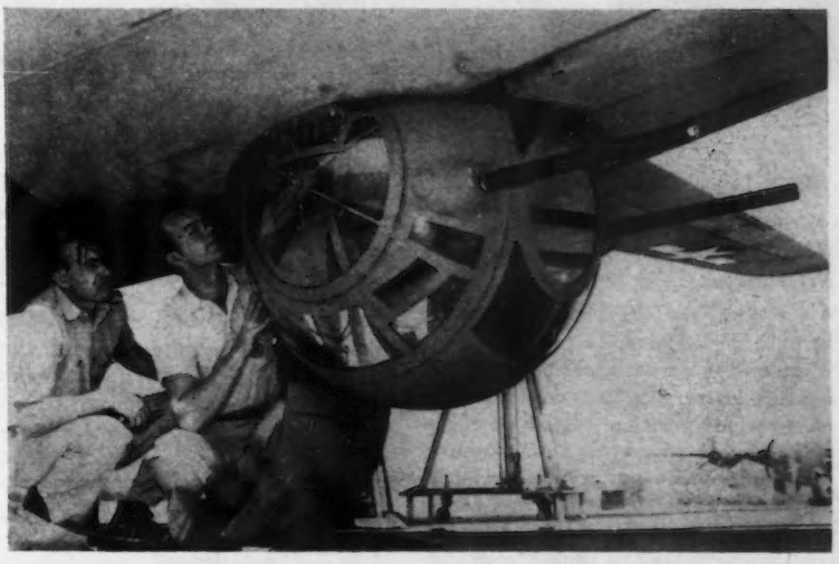
• • • **Alleged use** of defective and substandard material at the Lockland, Ohio, plant of Wright Aeronautical Corp. has been largely corrected, Senator Harry W. Truman, chairman of the special Senate committee investigating war production, reported here in a radio speech. The charge that the aircraft company was using substandard material was originally made by the committee in June.

Senator Truman also asserted that Undersecretary of War, Robert P. Patterson, had confirmed the committee's findings with respect to the construction and inspection of engines at the Lockland plant.

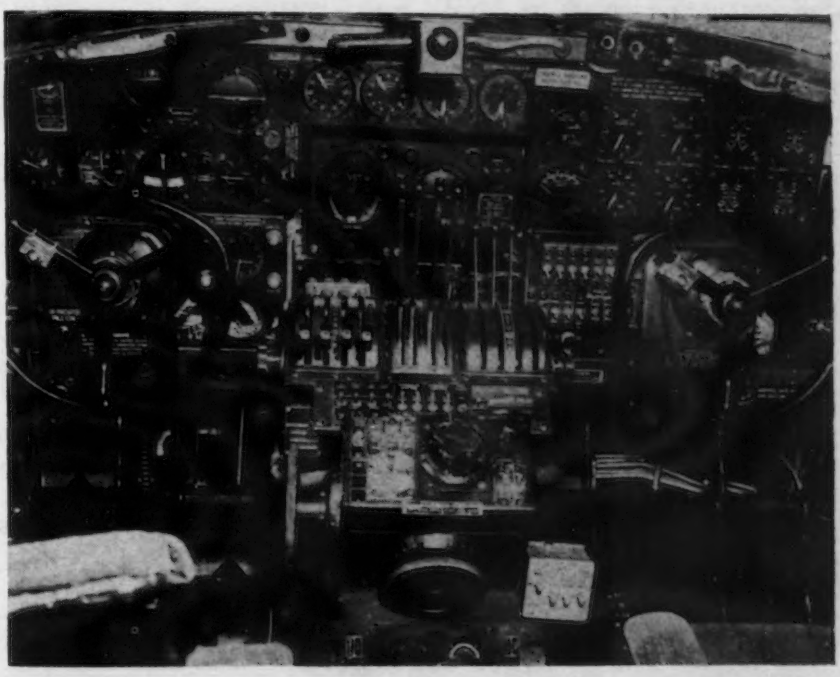
The Senator also charged as unfounded, the claim that the committee's investigations were holding up war production. The WPB had advised the committee, Truman said, that the deliveries of aircraft have been affected in only one case, that of a Navy flying boat.

The Senator also revealed that the Army was re-examining 100 Wright engines completed before the investigation began. A report on the first 10 engines examined has been completed, he said, but was not made public.

LIBERATOR'S "STINGER": A retractable Sperry ball turrett replaces the turret formerly used in the belly of the Liberator bomber. Four turrets with five fixed guns, and 13 .50 caliber machine guns now defend the B-24 on bombing missions.



ON THE INSIDE: Below is shown the instrument panel of the Consolidated Liberator bomber, the B-24.



SCRAP:

Statistics, Supply Factors Indicate Real Need for Campaign

o o o

Pittsburgh

• • • With the start of a national scrap drive, arguments continue as to whether the scrap situation throughout the country is in a serious or a near-serious position. Some of these side-bar controversies already have had their effect on preliminary pep meetings which preceded the scrap drives. If this state of affairs should continue very long, it probably will be a sure indication that the industrial, farm and home scrap collections will fall short of expectations.

The silent complacency entertained by some scrap and steel people probably is engendered by recent statistics on scrap inventories and consumption. During normal times, without exigencies of a war torn economy, such reliance on cold statistics probably would be in order. However, under today's conditions, where flexibility is a watchword, and where no chances can be taken on the question of adequate raw material supplies, dependence on scrap statistics, especially without a much deeper analysis of such figures, could lead to some troublesome times ahead.

Elsewhere in this story are the latest inventory reports of the Bureau of Mines. Some comfort has been taken from the fact that July reports indicate scrap inventories throughout the country amounting to 6,860,000 gross tons. This represents close to a two per cent drop from June, and is only about a two per cent difference from last December. One significant feature, however, has been a slow decline in inventories recently, when during the same period last year inventory accumulations were on the increase.

While the overall scrap inventory figure might indicate a comfortable position, there are some factors which detract from such an optimistic outlook. The inventory data is an overall figure and does not disclose the maldistribution in existing supplies. There are some districts today which are having difficulty obtaining open hearth scrap and blast furnace grades. There are other districts, somewhat remote from the larger steel centers, which probably have more scrap than they need. Obviously, such material can be moved if necessary to centers needing supplies; but with the transportation problem being what it is today it could prevent the receipt of scrap when and as needed.

Trend in Ferrous Scrap—Inventories—Consumption—Production Bureau of Mines Figures
Gross Tons—000 Omitted

Month	Total Inventories (End of Month)	Total Consumption	Railroad and Mfrs.' Scrap Production
1942			
Jan.	4100	4425	531
Feb.	4073	4204	514
March	4101	4661	600
April	4324	4603	616
May	4602	4665	626
June	4859	4464	641
July	5087	4470	644
Aug.	5279	4478	696
Sept.	5545	4424	758
Oct.	6260	4770	832
Nov.	6742	4401	755
Dec.	6930	4497	765
1943			
Jan.	6877	4492	775
Feb.	6871	4178	806
March	6850	4787	959
April	6918	4642	955
May	6905	4723	925
June	6916	4493	914
July	6860	4570	898

Note: Inventories are on last day of month; scrap production includes only from railroads and manufacturers; inventories and consumption include purchased and home scrap.

During March and April of 1942, total scrap inventories were listed at between 4,000,000 and 4,300,000 tons. It is significant that scrap inventories since December, 1942, have practically remained constant and the July figure indicates a downward trend, no matter how slight. On a practical basis, less than 3,000,000 tons of this inventory would have to be used to produce a condition which existed in the early part of 1942. The country, especially at this time, cannot stand to have such a condition be repeated.

A glance at the total consumption figures indicates that during the past five months the consumption level is definitely higher than the previous five months. The consumption of scrap in the coming months will undoubtedly continue to increase since existing blast furnaces are producing at capacity—that is, a capacity based on war time achievements. Even though the ore situation may not change for the worse early next year, probably little added help can be expected from the blast furnaces than is now being extended. Therefore, the weight of demand for more steel over the next

six months rests entirely on the adequacy of scrap supplies.

Another indication that the scrap situation should be watched closely is the slight, but nevertheless important, downward trend in the production of railroad and manufacturers scrap. After mounting rapidly throughout 1942, production of scrap from the railroads and industrial plants reached a high of 955,000 tons in April of this year.

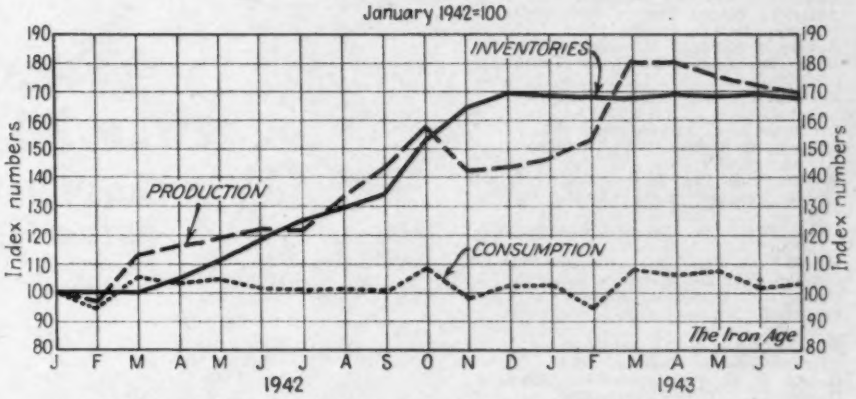
The trend has been downward since, and in July industrial scrap production had dropped to 898,000 tons, the lowest figure since February of this year. This is a decline of 11 per cent since April.

If some weight is given the very slight decline in scrap inventories, the increase in scrap consumption and the downward trend in the production of industrial scrap, it certainly appears that it is time for a successful scrap drive. The most important feature of the present scrap situation is not that we have a shortage or that one is in the making, but rather steps should be taken immediately so that there is no chance of any open hearth capacity going down for lack of scrap between now and next Spring.

Obviously, if the steel and scrap industries could be assured of a continuation of conditions which have occurred over the past several months, there might not be any need for closely scrutinizing the scrap picture. However, a list of possibilities which could change things—and some are probabilities—would be outlaw coal strikes, frozen rivers, early closing of the ore season, lack of proper transportation facilities in emergency cases, further tightness in the coke supplies, and the sudden realization that practically all "junkies" or peddlers have disappeared, with the result that a great number of yard dealers are entering the Fall season with bare yards. There appears to be some sort of a safety factor in national scrap supplies, but safety factors have a way of disappearing over night when events abroad, both in the European theatre and the Pacific areas, take a different turn.

TRENDS IN FERROUS SCRAP - INVENTORIES - CONSUMPTION - PRODUCTION

SOURCE MATERIAL - BUREAU OF MINES
COMPILATIONS - THE IRON AGE



NOTES: Inventories are on last day of month; Scrap production includes only from Railroads and Manufactures; Inventories and Consumption include purchased and home scrap

Wire Rope Sales to Be Over 200,000 Tons

Pittsburgh

• • • **One of the little giants** in the war effort today appears to be wire rope. While the steel necessary to produce wire rope this year probably is less than one-fifth of one per cent of all the steel produced, wire rope enters into many phases of war production, distribution and fighting.

One heat from a single large furnace at Jones & Laughlin Steel or the Carnegie-Illinois new Homestead open hearths probably would supply most of the steel necessary to produce all the wire rope which will be sold this year. It is estimated that wire rope sales in 1943 will be more than 200,000 tons, and may possibly reach 230,000 tons.

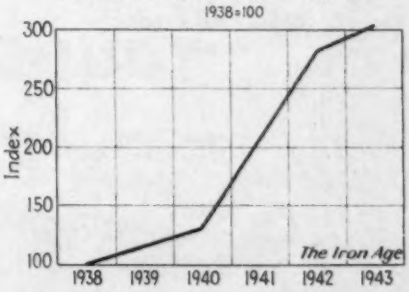
Wire rope goes into airplanes, construction, logging, military and naval equipment, oil, utilities and transportation. In addition to its own increased demands, the United States must also supply wire rope for oil drilling and other uses formerly satisfied by German and British products.

Since 1938, sales of wire rope have increased approximately 200 per cent, and since 1940 sales have moved up 170 per cent. In 1938, according to the Wire Rope and Strand Manufacturers Association, wire rope sales, on a tonnage basis, were 75,600 tons. In 1941 sales had zoomed to 155,515 tons, and in 1942 were boosted to 211,826 tons.

Distribution of wire rope this year probably will fall along somewhat the same lines as an analysis of shipments made by the Wire Rope Association indicated a year ago. The Army and Navy this year probably will take 15 per cent or more of the wire rope. Mining operations are expected to take better than 9 per cent, oil and natural gas more than 10 per cent, and the iron and steel industry alone, due to its heavy usage of wire rope, probably will take close to 13 or 14 per cent of wire rope shipments. Heavy shipments will also be made to the lumber and logging industry, the shipbuilding industry and construction. Exports also will probably be higher this year than they were last year.

Tonnage is probably not a good criterion of wire rope production because the greatest demand is for wire rope in the smaller diameters, which weigh the least per foot. For example, the Wire Rope Association says that 10,000 ft. of 3/15-in. aircraft control cable weighs 600 lb., 10,000 ft. of ½-in. winch cable weighs 4,000 lb., while 10,000 ft. of 2-in. mine incline cable weighs 64,000 lb.

GROWTH OF WIRE ROPE SALES
1938-1943
SOURCE: WIRE ROPE AND STRAND MFGRS ASSN.



Brass Mills and Their Products

Name of Company	Alloy Strip	Alloy Rod & Wire	Alloy Tube	Cu. Strip	Cu. Rod	Cu. Tube	Cu. Alloy Strip	Cu. Alloy Rod
American Brass Co., Waterbury, Conn., Ordnance Div.	*	*	*	*	*	*	*	*
Kenosha Brass Co., Kenosha, Wis.	*						*	
American Mang. Bronze, Holmesburg, Phila., Pa.		*						*
Ampco Metal, Inc., Milwaukee, Wis.								
Bohn Aluminum & Brass Detroit, Mich.		*						
Bridgeport Brass Co., Bridgeport, Conn.	*	*	*	*	*	*	*	*
Ordnance Div., Indianapolis, Ind.	*						*	
Bridgeport Rolling Mills, Bridgeport, Conn.	*						*	
Bristol Brass Co., Bristol, Conn.	*	*						
Callite Tungsten Corp., Union City, N. J.		*		*				
Chase Brass & Copper, Waterbury, Conn.	*	*	*	*	*	*	*	*
Euclid Case Plant Div., Cleveland, O.	*						*	
Chicago Extruded Metals, Cicero, Ill.		*						
Driver Co., Wilber B., Newark, N. J.							*	*
Eastwood Nealley Corp., Belleville, N. J.								*
Electric Materials Co., North East, Pa.				*	*			
Extruded Metals, Belding, Mich.		*						
Harris, F. A., Inc., Springfield, Mass.		*						*
Hussey Co., C. G., Pittsburgh, Pa.	*			*			*	
International Silver Co., Meriden, Conn.	*						*	
Lewin-Mathes Co., St. Louis, Mo.			*			*		
Miller Company, Meriden, Conn.	*						*	*
Mueller Brass Co., Port Huron, Mich.		*	*			*		*
New Haven Copper Co., Seymour, Conn.	*			*			*	
New England Brass Co., Taunton, Mass.	*						*	
Phelps Dodge Copper Prod., New York, N. Y.	*	*					*	*
Phosphor Bronze Smelting, Phila, Pa.								
Plume & Atwood Mfg. Co., Thomaston, Conn.	*	*						
Revere Copper & Brass, New York, N. Y.	*	*	*	*	*	*	*	*
Ordnance Div., Chicago, Ill.	*						*	
Riverside Metal Co., Riverside, N. J.	*						*	*
Scovill Mfg. Co., Waterbury, Conn.	*	*	*	*	*	*	*	*
Seymour Mfg. Co., Seymour, Conn.	*						*	*
Stamford Rolling Mill, Springdale, Conn.	*			*			*	
Titan Metal Mfg. Co., Bellefonte, Pa.		*						*
U. S. Navy Yard, Washington, D. C.	*							
Volco Brass & Copper, Kenilworth, N. J.	*	*						*
Waterbury Rolling Mills, Waterbury, Conn.	*			*			*	
Western Cartridge Co., East Alton, Ill.	*						*	
Western Electric Co., Cicero, Ill.	*							
Wheeling Bronze Casting, Wheeling, West Va.								*
Winchester Repeating Arms, New Haven, Conn.	*						*	
Wolverine Tube Co., Detroit, Mich.			*			*		

Redraw and Reroll Mills

Name of Company	Alloy Strip	Alloy Rod & Wire	Alloy Tube	Cu. Strip	Cu. Rod	Cu. Tube	High Cu. Alloy Strip	High Cu. Alloy Rod
Baltimore Brass Co., Baltimore, Md.	*			*			*	
General Tube Co., Newark, N. J.			*			*		
H & H Tube Co., Detroit, Mich.	*		*			*		
Howard Brass & Copper Co., Milwaukee, Wis.			*			*		
Linderme Tube Co., Cleveland, Ohio			*			*		
MacKenzie Walton Co., Pawtucket, R. I.			*			*		
Metals, Inc., Elizabeth, N. J.			*					
Nat'l Copper & Smelting, Cleveland, Ohio			*	*		*		
Penn Brass & Copper Co., Erie, Pa.			*			*		
G. W. Prentiss & Co., Holyoke, Mass.		*						
Roberts Tube Works, Detroit, Mich.			*			*		
Somers Brass Co., Waterbury, Conn.	*		*					
Superior Tube Co., Norristown, Pa.			*			*		
Thinsheet Metal Co., Waterbury, Conn.	*			*			*	
United Wire & Supply, Providence, R. I.		*	*			*		
A. H. Wells & Co., Waterbury, Conn.		*	*			*		
Wickwire Brothers, Inc., Cortland, N. Y.		*						

Brass Mills Producing Beryllium Copper Brass Mill Products

Primary Mills	Strip	Rod	Wire	Tube
American Brass Company, Waterbury, Conn.	*(.010 Min.)	*	*	*
Beryllium Corporation, Reading, Pa.	*(.005 Min.)	*	*	
W. B. Driver Company, Newark, N. J.	*(.003 Min.)	*	*	
Riverside Metals, Riverside, N. J.	*(.010 Min.)	*	*	
Redraw & Reroll Mills	**Strip**	**Rod**	**Wire**	**Tube**
Somers Brass Company, Waterbury, Conn.	*(.00175 Min.)		(flst.002)	
Baltimore Brass Company, Baltimore, Md.	*(.003 Min.)			
Driver-Harris, Harrison, N. J.	*(.006 Min.)		*	
Callite-Tungsten Corp., Union City, N. J.			*	
Little Falls Alloys, Inc., Little Falls, N. J.			*	
Superior Tube Company, Norristown, Pa.				*
MacKenzie-Walton Co., Pawtucket, R. I.				*

* Identifies products made by Brass Mills.

Weirton Processing Brass Slabs Upon its Steel Rolling Mills

Weirton, W. Va.

• • • An excess of brass casting capacity over existing brass finishing equipment plus a pioneering spirit in one of the country's larger steel mills has brought about the processing of brass slabs on steel rolling mills at Weirton Steel Co., Weirton, W. Va.

At present Weirton Steel is the sixth largest brass roller in the country, according to the company. The experiment was undertaken by Weirton engineers earlier this year after the Pittsburgh ordnance chief, Frank Bell, approached Tom Milsop, Weirton president, as to the possibilities of rolling brass for cartridge and shell cases.

Brass mill experience was of little value to Weirton because of the necessity for using steel mill equipment. After a try with brass slabs and further study on reduction of the brass, Weirton developed its own technique which resulted in satisfactory tests at a U. S. Arsenal. Two major difficulties in the beginning were, working to such a thin gage and the tendency of the brass to curl around the rolls and to dip between the table rollers of the mill.

• • • This catalog of brass mills and their products as been issued by the Materiel Command, Aircraft Scheduling Unit, Wright Field, in an effort to assist aircraft makers. The list is not to be considered final or all-inclusive. Mills should be contacted by contractors to determine particular specifications.

Gage difficulties were solved through experience and the curling of brass was eliminated by roll adjustments and installation of additional table rollers and use of aprons. Brass slabs are now hot rolled on a structural mill and cold rolled to gage on 48-in. tandem cold mill. Weirton will soon do its own machining or "scalping" of the brass and also will be able to make the gage on the cold rolling with one pass through the cold mill, instead of two as at present.

Weirton's brass rolling capacity is about 50 million lbs. a month. The finished plate is sent to cartridge and shell case plants. The tolerance for the brass plate is four thousandths of

(*Continued on Page* 114)

"MORE PRODUCTION, BETTER FINISH, REJECTS ELIMINATED—Grinding Airplane Cylinder Valve Seats"

writes
POR-OS-WAY'S WAR PLANT REPORTER

Dear Charlie:

I'm writing this from the [redacted] plant, and here's more bad news for the Axis.

The use of Por-os-way is producing one additional airplane barrel, with valve seats precision-ground, every working hour. Multiply that one out, and you can see that Por-os-way's got something — something that the Axis doesn't like.

So long 'til next report

Your roving reporter

"Vic"

THE JOB:
Removing .010" to .012" from valve seats of airplane cylinder barrels on a Waddell Valve Seat Grinder—wet grinding at 5,000 R.P.M.

THE WHEEL:
Por-os-way 3¼" x ⅞" x 1⅛" C80 HV3.

All facts and figures given are taken from an actual field survey made by a Por-os-way correspondent.

WRITE *for complete booklet "Facts About Por-os-way". The address is 434 Wheatland St., Phoenixville, Pennsylvania*

See our exhibit booth at Room 777, Palmer House, National Metal Congress, week October 18.

THE RECORD	POR-OS-WAY	FORMER WHEEL
Pcs. per Hour (2 Seats per Cylinder Barrel)	5*	4
Dressings	None	3 per wheel
Pcs. Per Wheel	300-375	120-150
Life of Wheel	1½ days	1 day
Average Depth of Cut	.005"—.008"	.001"—.003"
Rejects	None	2%
Finish	Superior	———

*Conservative. Por-os-way has proved ability to grind 8 pcs. per hour, or 100% more than former wheel.

Remarks (by foreman). "My men take pride in their work. If a wheel is too hard and burns work, it means lost time and material and gets them sore. We are sold on the merits of Por-os-way."

2 TO 5 TIMES MORE WAR PRODUCTION PER MAN PER MACHINE

50TH YEAR

POR-OS-WAY*
a new RADIAC* PRODUCT

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Political Factor the Ruling One In Post-War Planning, Flanders Says

Toronto

• • • **The problem of post-war** planning divides itself into two parts, the first being the determination of what is economically, industrially and scientifically possible; the second and the ruling factor being the question of what is politically possible, according to Ralph E. Flanders, president of the Jones & Lamson Machine Co. He was one of those who spoke on post-war planning at a joint meeting in Toronto of the Engineering Institute of Canada and the American Society of Mechanical Engineers, Oct. 2.

Ultimately, Mr. Flanders said, politics in the broad sense determines what we can do and what is going to happen to us. As specialists in their profession, engineers have to realize that their usefulness is limited by the political conditions in which all have to participate as citizens. It is becoming increasingly clear, he continued, that the determining factor in the post-war world lies with the relations between the United States and Great Britain on the one hand and Russia on the other, with a corresponding effect on the future of China. We probably need not fear Russia from the standpoint of military conquest, but the problem she will pose will be a political one.

We must not be surprised to find that Russia will come out of this war with her political influence dominant in the Baltic States, in Poland, in the Danube basin and even in the Balkans, Mr. Flanders said. The repercussions of this international post-war problem will not terminate at the boundaries of those countries which tie up their fortunes with Russia, but will be felt throughout the British Empire and in the United States. He envisions a real ideological war beginning at the termination of physical warfare, but affirms his belief that the political principles of Eastern Europe never have and never can provide for the common man the advantages which free enterprise has provided for him in the past. The speaker welcomes this coming ideological contest with confidence. "Our warfare will be waged by increasing the well being of our country and its citizens, not by destroying that well being. The peril is great; the opportunity is even greater and engineers have a great role to play," he concluded.

As to the economic phases of post-war planning, Mr. Flanders believes the whole situation demands the engineering approach. It is the role of the engineer to apply the discoveries of pure science to the practical attainment of human desires. Referring to the part engineers have played in the science of hygiene in the elimination of disease by proper sewage disposal, food handling and refrigeration, the speaker compared the work now being done by the Committee for Economic Development as being in effect the application of principles of hygiene to the support of the health of our social body.

In the detailed planning for individual companies, for communities and for whole industries, the engineers concerned have a large part to play. They are concerned with the development of new products, with the development of their communities and the public works which are needed therein and which can furnish a reservoir of employment for times when employment is falling off.

o o o

Four Improvements Made in Redistribution Program by ASU

• • • **Through four major** changes, the Aircraft Scheduling Unit, at Dayton, Ohio, has improved its redistribution program.

Under this program the ASU has maintained lists of idle and excessive surplus steel, copper, aluminum and aircraft hardware. Operating under Directive 16 of the WPB, all specified aircraft contractors listed on Schedule "A" of this directive were required to report their idle and excessive surplus materials to ASU. The materials to be reported were listed in Schedule "B" of this directive. Two of the above changes affect these schedules.

First, on Schedule "A" the names of about 60 additional aircraft contractors have been added while approximately 90 have been deleted. These changes were necessitated by a desire to serve those contractors whose business and material problems were of primary concern to ASU.

Second, Schedule "B" has been augmented to include certain critically needed aircraft component parts. Because of the success of the ASU redistribution efforts, shortages of these additional parts may now be alleviated by inter-company transfers.

Third and perhaps the most important change in the present ASU redistribution program is the omission of the required "excessive surplus" reporting. Now specified aircraft contractors may voluntarily report only those long "excessive surpluses" which they wish the ASU to assist them to sell.

Fourth, ASU Regulation No. 1 of WPB Directive No. 16 has been revised. In an effort to eliminate complete periodic reports on all items of "idle surplus" materials, a supplementary report will be filed. These supplementary reports will be filed by the specified contractors on or before the 15th of each month starting on Oct. 15. They will report on those items of materials listed in Schedule "B" of WPB Directive No. 16 which has become "idle surplus" during the preceding calendar month.

Iron and Steel Output in Two Wars

• • • Here are comparisons cited by C. D. King, chairman of operating committees, United States Steel Corp. of Delaware, at the A.I.M.M.E. meeting in Washington on Sept. 29:

On Dec. 31, 1918, 351 out of 459 blast furnaces were in operation, with total production of 43,738,230 net tons. In 1942, 230 furnaces were operating out of 242, with output of 60,903,304 net tons.

In 1918, average blast furnace production per day was 349 net tons; today it is well over 700. In 1918, the largest furnace produced 630 net tons per day; today a number of units are making 1500 tons daily.

In 1918, the largest furnace at one of the Pittsburgh district plants had hearth diameter of 18 ft. and volumetric capacity of 23,868 cu. ft. A recent DPC furnace at the same plant has 27 ft. 6 in. hearth diameter and volumetric capacity of 51,654 cu. ft.

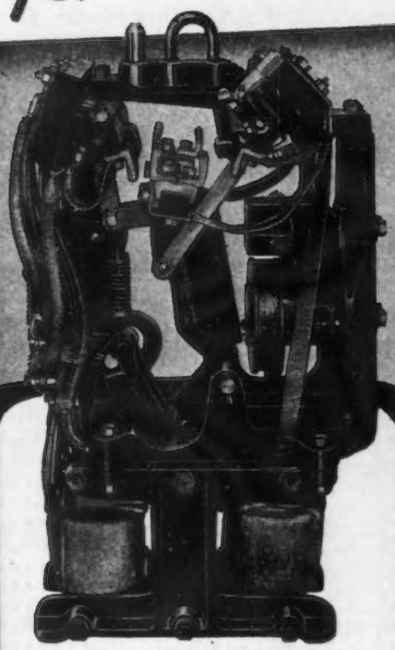
In 1918, the average U. S. Steel Corp. furnace was relined after producing 625,000 tons; today the average stack is relined after 1,800,000 tons.

In 1918 U. S. Steel Corp. operated 320 open hearth furnaces and produced 15,000,000 net tons of ingots; in 1942 U. S. Steel Corp. operated 322 open hearths and produced 27,100,000 net tons of ingots.

The average size of heat tapped in 1918 was 80 tons vs. 120 tons in 1942. (A new plant at Pittsburgh is producing 225-ton heats).

A Pittsburgh open hearth plant which in 1918 was tapping 110 ton heats with a daily production of 194 net tons per furnace and fuel consumption of 6,600,000 b.t.u. per net ton of ingots; today is tapping 169 net ton heats, producing 310 tons per day and consuming 3,700,000 b.t.u. per net ton of ingots.

EC&M REDUCED VOLTAGE STARTERS for 110-550 Volt MOTORS



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Single, quick-break, double-throw Contactor operated by a *single* magnet. Quick transfer from reduced voltage starting to full voltage running by a throw-over spring and a mechanical latch tripped by a current limit relay.

Bulletin 1045-A

Complete unit with conduit-connection box at rear and overload relays under cover-hood.

PUSH BUTTON OPERATED

HERE'S a starter that is very popular with operating and maintenance men. It is not an adaptation of contactor-equipment, but a simple, completely wired unit, totally enclosed and oil-immersed in a steel tank.

Total oil-immersion of the compensator-mechanism not only permits interrupting the circuit under oil (recognized as an effective means for breaking alternating currents) but also provides continuous lubrication for all operating parts of the mechanism and protects them from dust, moisture and corrosion.

In over 1000 plants, these EC&M starters have provided fool-proof, dependable operation for a number of years. Bulletin 1045-A completely describes them. Write for your copy today.

THE ELECTRIC CONTROLLER & MFG. CO.

2700 E. 79th St. ★ Cleveland 4, Ohio

September Records Are Revealed

• • • **Steel production** during September by Republic Steel Corp. was the highest of any 30-day month in the company's history, when 723,981 tons of steel ingots were produced. The Cleveland strip mill broke all records by producing more than 115,000 tons of plate, strip, and sheet, as compared with a previous high of 113,000 tons made in May, 1943. At the Youngstown Republic plants, the ingot record of 116,226 tons made in March, 1943, a 31-day month, was broken with the September record of 120,415 tons. For the first nine months of 1943, operating at an average rate of 102.1 per cent of capacity, the company in all plants produced 6,377,868 tons of steel as compared with 5,942,446 tons for the similar period of 1942.

•

• • • **Jones & Laughlin** Steel Corp. established a new all-time high record for the production of steel for war in a 30-day month. The new record exceeds by more than 1300 tons the company's best previous record of April, 1943. The Otis Works, Cleveland, also established new high marks at its No. 2 Blast Furnace, its 77 in. hot strip mill and its sintering plant.

August Steel Shipments 5,535,118 Tons

Source: American Iron & Steel Institute

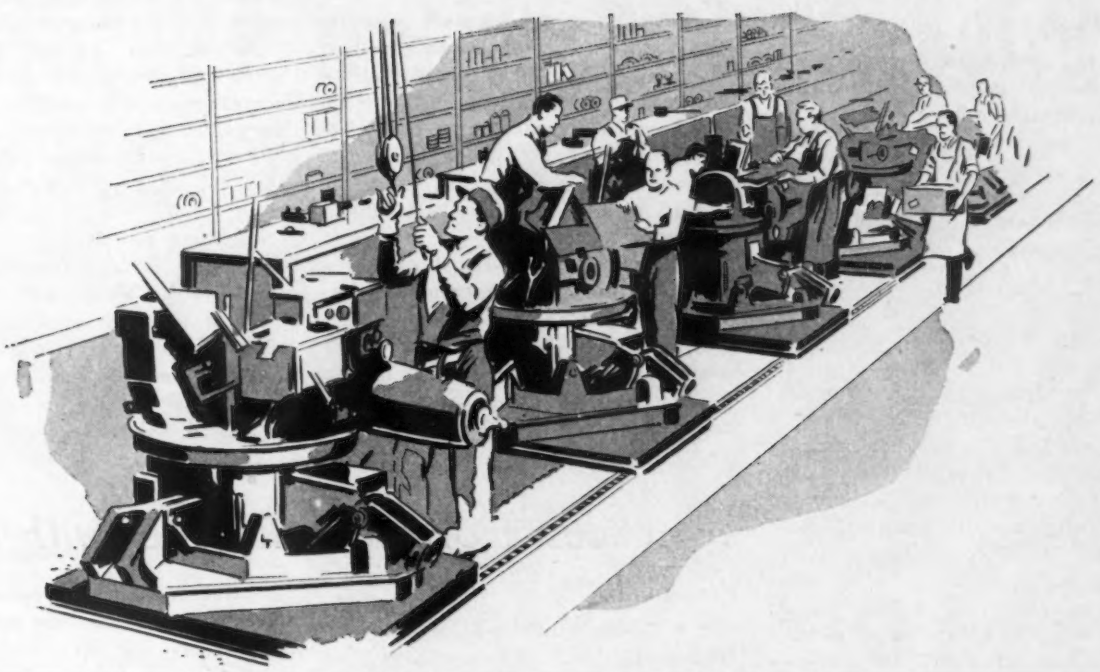
		Number of companies	Items	Annual Capacity Net tons	Production for Sale—Net Tons: Current Month: Total	Current Month: Per cent of capacity	Current Month: Shipments: Export *	Current Month: Shipments: To members of the industry for conversion into further finished products	Year to Date: Total	Year to Date: Per Cent of capacity	Year to Date: Shipments: Export *	Year to Date: Shipments: To members of the industry for conversion into further finished products
Steel Products	Ingots, blooms, billets, slabs, sheet bars, etc.	44	1	xxxxxxx	716,530	xxx		254,324	3,419,513	xxx		1,605,421
	Heavy structural shapes	10	2	5,412,580	324,435	70.6		xxxxxxx	2,508,978	69.6		xxxxxxx
	Steel piling	4	3	338,000	1,076	3.7		xxxxxxx	23,657	10.5		xxxxxxx
	Plates—Sheared and Universal	21	4	9,189,740	1,035,733	132.7		3,349	8,486,847	138.7		26,017
	Skelp	7	5	xxxxxxx	71,244	xxx		42,394	539,723	xxx		322,022
	Rails—Standard (over 60 lbs.)	4	6	3,629,260	159,083	51.6		xxxxxxx	1,200,348	49.7		xxxxxxx
	Light (60 lbs. and under)	6	7	309,690	12,687	48.2		xxxxxxx	115,493	56.0		xxxxxxx
	All other (incl. girder, guard, etc.)	2	8	102,000	1,331	15.4		xxxxxxx	16,656	24.5		xxxxxxx
	Splice bar and tie plates	13	9	1,120,270	46,094	48.4		xxxxxxx	416,202	55.8		xxxxxxx
	Bars—Merchant	40	10	xxxxxxx	587,737	xxx		77,837	4,731,734	xxx		631,192
	Concrete reinforcing—New billet	15	11	xxxxxxx	34,513	xxx		xxxxxxx	287,763	xxx		xxxxxxx
	Rerolling	16	12	xxxxxxx	3,970	xxx		xxxxxxx	57,763	xxx		xxxxxxx
	Cold finished—Carbon	23	13	xxxxxxx	144,842	xxx		xxxxxxx	1,170,761	xxx		xxxxxxx
	Alloy—Hot rolled	20	14	xxxxxxx	258,022	xxx		30,324	2,034,495	xxx		294,328
	Cold finished	19	15	xxxxxxx	36,655	xxx		xxxxxxx	316,963	xxx		xxxxxxx
	Hoops and baling bands	5	16	xxxxxxx	5,200	xxx		xxxxxxx	65,330	xxx		xxxxxxx
	TOTAL BARS	63	17	14,719,525	1,070,939	85.6		108,161	8,664,809	88.4		925,520
	Tool steel bars (rolled and forged)	17	18	200,840	16,150	94.6		xxxxxxx	139,408	104.2		xxxxxxx
	Pipe and tube—B. W.	15	19	2,231,040	115,836	61.1		xxxxxxx	880,789	59.3		xxxxxxx
	L. W.	8	20	845,400	46,582	64.9		xxxxxxx	374,197	66.5		xxxxxxx
	Electric weld	8	21	1,149,250	87,180	89.3		xxxxxxx	689,481	90.1		xxxxxxx
	Seamless	15	22	3,082,400	191,762	73.2		xxxxxxx	1,433,455	69.8		xxxxxxx
	Conduit	7	23	190,000	3,927	24.3		xxxxxxx	39,292	31.1		xxxxxxx
	Mechanical Tubing	11	24	597,800	59,821	117.8		xxxxxxx	495,475	124.5		xxxxxxx
	Wire rods	22	25	xxxxxxx	93,438	xxx		17,457	791,093	xxx		155,712
	Wire—Drawn	41	26	2,356,550	163,862	81.8		5,116	1,314,138	83.7		40,163
	Nails and staples	19	27	1,116,640	62,004	65.4		xxxxxxx	552,508	74.3		xxxxxxx
	Barbed and twisted	15	28	482,280	19,438	47.4		xxxxxxx	162,005	50.4		xxxxxxx
	Woven wire fence	16	29	778,060	24,675	37.3		xxxxxxx	154,301	29.8		xxxxxxx
	Bale ties	12	30	128,420	9,921	90.9		xxxxxxx	75,335	88.1		xxxxxxx
	All other wire products	8	31	78,220	4,460	67.1		xxxxxxx	40,084	77.0		xxxxxxx
	Fence posts	11	32	112,065	5,474	57.5		xxxxxxx	24,763	33.2		xxxxxxx
	Black plate	10	33	339,700	30,606	106.0		22	206,004	91.1		22
	Tin plate—Hot rolled	4	34	483,620	-	-		xxxxxxx	10,597	3.3		xxxxxxx
	Cold reduced	10	35	3,841,340	205,360	62.9		xxxxxxx	1,489,190	58.2		xxxxxxx
	Sheets—Hot rolled	25	36	xxxxxxx	461,020	xxx		17,337	3,966,298	xxx		137,001
	Galvanized	14	37	xxxxxxx	64,867	xxx		xxxxxxx	534,015	xxx		xxxxxxx
	Cold rolled	14	38	xxxxxxx	118,694	xxx		xxxxxxx	976,945	xxx		xxxxxxx
	All other	15	39	xxxxxxx	27,958	xxx		xxxxxxx	239,150	xxx		xxxxxxx
	TOTAL SHEETS	28	40	13,497,570	672,539	58.6		17,337	5,716,408	63.6		137,001
	Strip—Hot rolled	22	41	3,201,690	129,978	47.8		19,186	1,016,305	47.7		121,933
	Cold rolled	39	42	2,059,740	99,982	57.1		xxxxxxx	768,458	56.0		xxxxxxx
	Wheels (car, rolled steel)	5	43	424,820	16,567	45.9		xxxxxxx	147,700	52.2		xxxxxxx
	Axles	6	44	453,470	11,120	28.9		xxxxxxx	106,198	35.2		xxxxxxx
	Track spikes	11	45	308,350	10,081	38.5		xxxxxxx	95,573	46.5		xxxxxxx
	All other	5	46	xxxxxxx	15,213	xxx		xxxxxxx	131,265	xxx		xxxxxxx
	TOTAL STEEL PRODUCTS	159	47	xxxxxxx	5,535,118	xxx		447,346	44,246,548	xxx		3,555,819
	Pig iron, ferro manganese and spiegel	26	48	xxxxxxx	779,118	xxx		391,912	5,992,154	xxx		2,890,559
	Ingot moulds	5	49	xxxxxxx	86,504	xxx		xxxxxxx	648,955	xxx		xxxxxxx
Iron Products	Bars	10	50	170,110	7,829	54.2		122	65,041	57.4		2,092
	Pipe and tubes	2	51	106,000	7,689	85.4		xxxxxxx	58,864	83.4		xxxxxxx
	All other	1	52	56,000	1,158	24.3		-	9,663	25.9		-
	TOTAL IRON PRODUCTS (ITEMS 50 to 52)	11	53	xxxxxxx	16,676	xxx		122	133,568	xxx		2,092

Total number of companies included, 183.

During 1942, the companies included above represented 98.8% of the total output of finished rolled products.

* In accordance with Government policy, export figures cannot be published.

DOES *One Part* THAT'S "A.W.O.L." SLOW UP YOUR PRODUCTION?



RIGHT now, when peak production is most vital, is your output being curbed by missing parts? Do failures to maintain proper precision and quality standards in difficult parts cause rejections that slow up your assembly lines?

Contact KAYDON

For present or postwar product improvement . . . for more production at lower costs, now and in the future . . . Kaydon precision facilities and experience in producing difficult parts may be the answer to your problems. Here, specially designed metalworking machinery for large or small precision parts . . . modern heat-treating and flame-hardening equipment . . . plus engineering facilities for designing and building special machinery . . . are at your service, to help improve your output and products.

CAPACITY Immediately AVAILABLE for ball and roller BEARINGS Size 6" to 60"

For excellence in production of extremely precise, unusually large ball and roller bearings.

THE KAYDON ENGINEERING CORP.

McCRACKEN STREET • MUSKEGON 81, MICH.

Specialists in Difficult Manufacturing

Secrecy in Job Priorities Termed Essential; Plan May Stop Labor Law

New York

• • • **The hush-hush** surrounding the allotment of labor priority ratings to individual employers, which has caused such a furor in the Buffalo-Niagara area, was described as an essential part of the Referral Hiring Plan by an authoritative War Manpower Commission spokesman here this week.

The secret decisions as to which manufacturer will be placed on the priority list for labor referral are made primarily by military procurement men, he said, and are based on the urgency of the product made by the particular concern to the war effort. Consequently, the identity of the priority and its recipient could serve as a tip-off to enemy agents regarding the products on which military emphasis was being placed. Beyond this, any effort toward secrecy was unimportant, THE IRON AGE was told.

As a matter of fact, it is believed that the military personnel so necessary to determining the disposition of manpower according to military needs for products would not have been persuaded to cooperate under any terms other than complete secrecy and the whole basis of the plan would have been useless.

However, even though complete secrecy regarding the decisions to allot top priorities to certain firms is maintained during meetings for this purpose, it appears to be of limited avail as any observer watching the flow of referred workers from plant to plant can estimate the trend. The unknown quantity is the exact "product-urgency" demanding the decision which remains hidden to all but a few closest to the subject.

Past charges relating to "devious means" and the possibility of bribery connected with the secrecy can hardly be countenanced in view of the military membership of the priority committee whose entire purpose is to boost production without cause for personal gain.

When asked why material priorities could be permitted to become such public knowledge while labor priorities were held secret, the spokesman pointed out that whereas material priorities blanketed whole programs of known urgency, labor priorities shifted almost from week to week in such a way that a keen enemy observer could trace the exact trend of military parts urgency and, perhaps, by coordinating information, decipher advance military strategy. A better understanding of this fact is believed to remove the cause for many of the objections and suspicions held against the plan.

Meanwhile labor in the Buffalo area continues to lodge numerous and bitter complaints against referral hiring, the main issue being the referral of workers to lower paying jobs by the USES. The WMC points out that the trouble, at least in this particular area results mostly from a gross inequality of wage scales between certain plants which reflects in referrals to lower wage brackets when men leave the higher paying plants in quest of new jobs.

Rather than leveling off all wage levels between plants as a means of correcting this inequality, it has been suggested that premium rates for the heavier, dirty, and so less desirable jobs, be set so that referral to such work would not carry with it the stigma of a pay drop.

Referral hiring, now that it has spread to the West Coast and is promised for all labor shortage areas, is admitted to be providing an equivalent of a national service act without the official approval of our national legislative body.

o o o

Warehouses Urged to Register with USES

Cleveland

• • • **Members of the Steel Products** Warehouse Association are urged to determine whether they have been classified as essential companies and if not to register the necessary facts with local United States Employment Offices. This same precaution, while issued particularly for members of this organization, applies to all steel warehouses.

Steel warehousing is an essential industry. But that does not mean that every warehouse is automatically classified as essential.

The local offices of United States Employment Services located in shortage areas keep a list of essential companies. It is of the highest importance that each warehouse check at once with the local USES office to determine whether it already is included on this list. If it is not included, apply at once for classification as an essential company. Because steel warehousing is classified nationally as an essential industry, most applications will almost certainly be granted. But, although application may be only a formality, it's a necessary one in all cities where USES keeps a list of essential companies.

When applying be sure to emphasize processing activities rather than purely distributive functions. Go into detail about such operations as shearing, flame-cutting, gaging, sizing, etc.

If listed as an essential company, you'll get the protection afforded by the local employment stabilization plans and USES will try to help fill your labor needs. Moreover, requests for deferment of workers will be strengthened if USES considers your plant essential. If unlisted, your workers are fair game for any essential plant and USES won't refer any new men to you.

o o o

Incentive Wage Approved for Grumman

Washington

• • • **A 5 per cent incentive** wage increase if production rises 10 per cent was granted last Friday by the National War Labor Board to the employees of the Grumman Aircraft Engineering Corp.

While the board has considered more than 800 requests for permission to put incentive plans into effect since April, NWLB laid down its first general policies relative to incentive plans in the Grumman case.

The board adopted two resolutions at the same time the decision was handed down. The first was that incentive plans will not be approved in cases of dispute. The second was that all incentive plans approved must conform to "hold-the-line' principles and not have a tendency to result in unauthorized wage-rate increases or

HELPING TO SOLVE TODAY'S WARTIME PRODUCTION PROBLEMS

Critical Extrusion Problem Solved by Martin Engineers

. . . ON THE WORLD'S LARGEST SPOTWELDER

Faced with a severe shortage of extruded parts which threatened the production of Marauder bombers. Martin tool engineers found the answer in the *spotwelding* of heavy aluminum stampings. Parts such as tank door ribs, wing ribs, spars, longerons and fuselage formers are now built up from sheet metal parts in gauges hitherto thought impossible to spotweld.

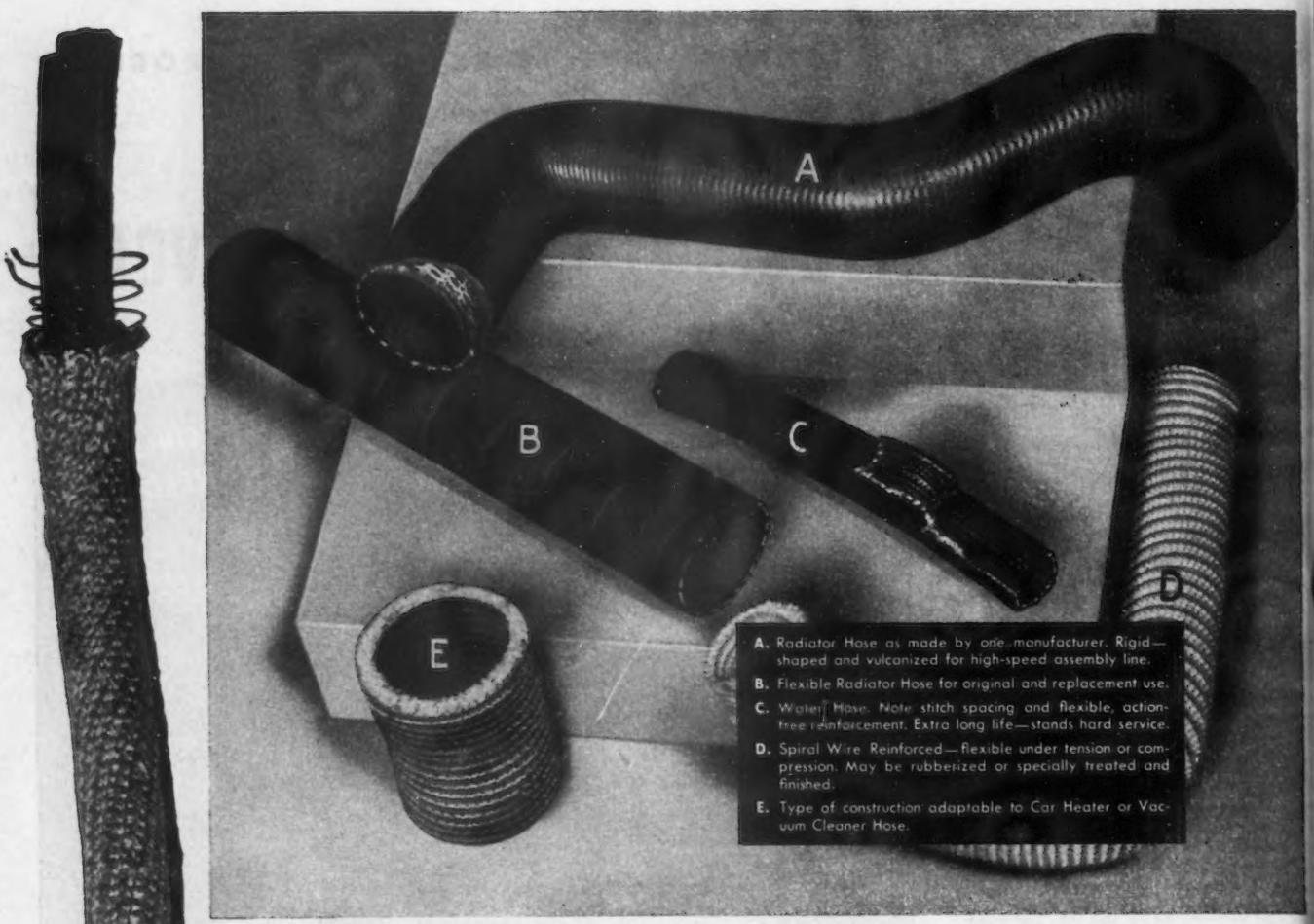
The huge machine doing this job, has been designed and developed by Sciaky to weld up to two thicknesses of .187" aluminum. Features which have proved so successful in the welding of lighter gauges are employed. The tremendous power required (a flow of 100,000 amperes) is compensated for by the use of STORED ENERGY, which delivers instantaneous welding current without disturbing the plant's power system. Precise control of pressure is accomplished by the Sciaky patented VARIABLE PRESSURE CYCLE which regulates pressures up to 12,000 lbs. in an automatic sequence.

While this machine is being operated twenty hours per day on production, experiments are being conducted to prove its adaptability to steel armor plate, as well as other heavy aluminum parts.

TYPE PMCO5S-1 SCIAKY ELECTRIC RESISTANCE SPOTWELDER, 240 KW. Welding capacity: Aluminum and other alloys or corrosion resisting steels in thicknesses of from .040" minimum up to and including .187" maximum. Speed: 40 spot welds per minute on two thicknesses of .040" of light alloys.

SCIAKY BROS.

Manufacturers of a Complete Line of
A.C. and D.C. Electric Resistance Welding Machines
4915 W. 67th Street, Chicago, 38, Illinois


A
B
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A. Radiator Hose as made by one manufacturer. Rigid—shaped and vulcanized for high-speed assembly line.
B. Flexible Radiator Hose for original and replacement use.
C. Water Hose. Note stitch spacing and flexible, action-free reinforcement. Extra long life—stands hard service.
D. Spiral Wire Reinforced—flexible under tension or compression. May be rubberized or specially treated and finished.
E. Type of construction adaptable to Car Heater or Vacuum Cleaner Hose.

What FIDELITY has done in Hose Manufacture, it is doing in other fields—perhaps yours

When war brought a greatly increased demand for rubber hose of many kinds, FIDELITY HOSE REINFORCEMENT MACHINES made the required production pace possible in a wide range of the most urgently needed types. It applied interlocked yarn and wire reinforcement, or yarn only in a spiraled and toggle formation that was pliant, conformed to the flexing of hose or tubing, preserved the bond and prevented rupture of the cover in sharp bends.

The same unit with interchangeable heads in Universal machine applied reinforcement to hose from ¼" to 2" in diameter at speeds from 6 to 10 feet per minute. Better product, more of it, and quicker—and almost noiselessly.

The record repeats itself in other fields:—Machines for knitting one to three covers on insulated wire—at 1500 feet per hour; yarn, packing and wire braiders that were smooth, silent and fast; machines that make the fabric tubes for oil filter cartridges in millions of gasoline engines; quill winders for weavers of wire cloth; intricate precision machines that turned out accurate pieces in astronomical numbers for our arsenals.

This is not a list, only a hint of the number and variety of unusual machines developed by FIDELITY and of its capacity to engineer, perfect, build or adapt for you the kind of compact, ingenious or automatic unit you want to have ready in the period of transition from war to peace.

Bulletins on FIDELITY Machines, of course, and a book about its engineering-development facilities. Write for a copy of "Facilities."

Note controlled stitch in spiraled formation without crease or wrinkle at bend. Single or double wire interlocked with yarn.

ARMY E NAVY

Designers and Builders of
Intricate, Automatic Precision Machines

32 YEARS' EXPERIENCE

FIDELITY MACHINE COMPANY

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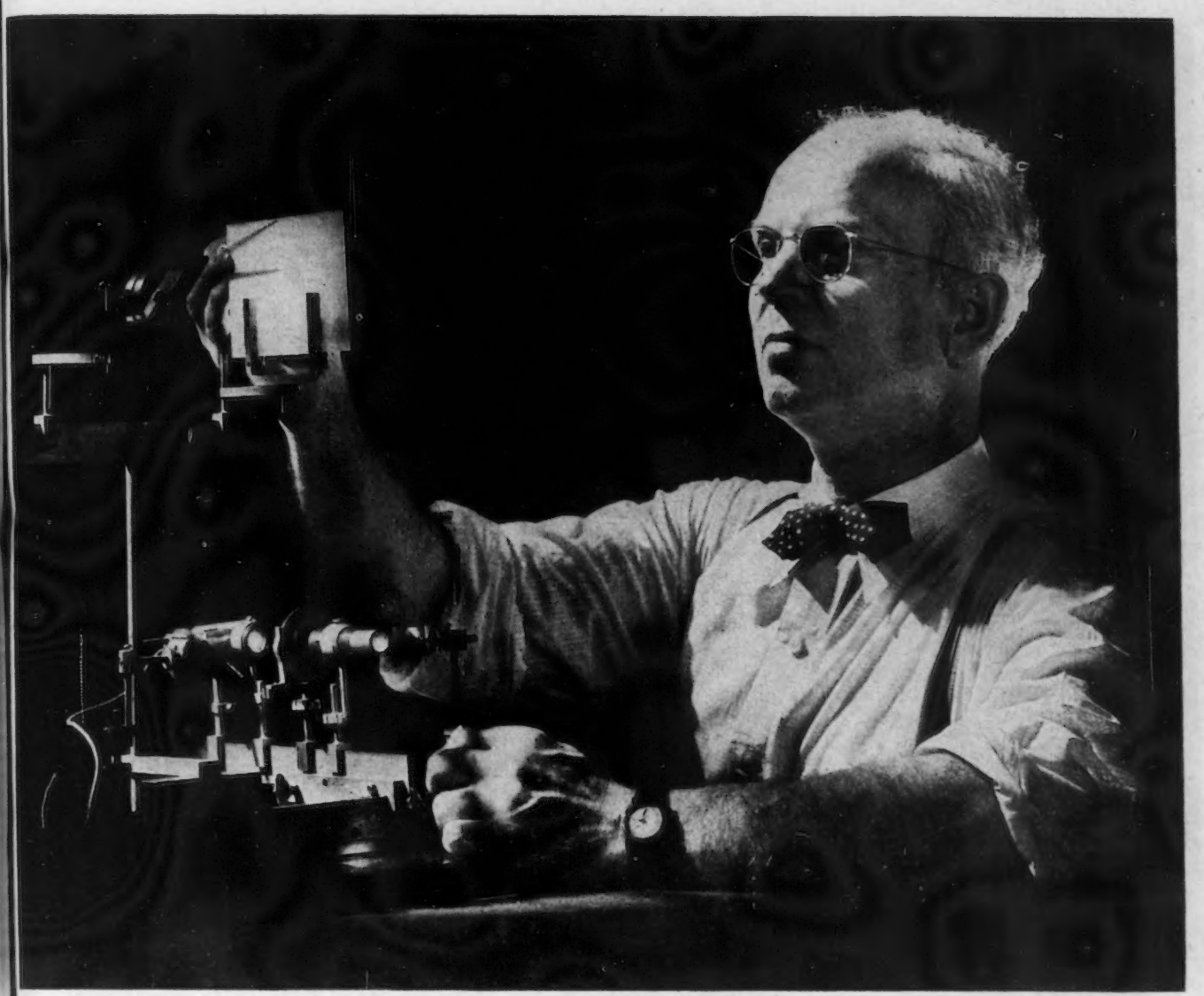


L. S. Williams, Senior Research Engineer. A Toledoman since 1924, his original research has widened the horizons of useful knowledge . . . resulting in new and important developments in precision force-measuring devices.

RESEARCH made Light fight, too

In this total war Light is fighting for us, in ways former wars never knew. Research in Optics, the Science of Light, has given new strength to our arms.

At sea, the deadly fire-power of our Navy owes its effectiveness to precise optical controls. In the air, the miracle lenses of map-making cameras probe the vitals of enemy installations miles away; and the precision of our high altitude bombing is a devastating demonstration of applied optical science.

Long before the war, Toledo Optical Research played its part in the search for new knowledge in the use and control of Light. It was ready when War called; as were Toledo Research developments in many other fields of war-need.

Today Toledo precision devices and controls located deep in the vital centers of War production serve their country in the production of plane engines, explosives, synthetic rubber and myriad other War uses.

And when the Great Tomorrow comes new progress, born of Toledo Research at War, will be ready for service in the broader fields of a World at peace again.

This Toledo Precision Device balances airplane propeller blades both longitudinally and transversely, permitting blades to be made fully interchangeable . . . and at field bases, permits worn or damaged blades to be rebalanced, rematched, and returned to service.

TOLEDO SCALE COMPANY

Toledo, Ohio

Canadian Toledo Scale Co., Limited, Toronto, Ont.

in an increase in the general level of production costs.

Board member George Taylor said that the Grumman plan could not be used as a ready-made model for extensive application. He said that on the contrary it has a limited application.

Mr. Taylor outlined WLB's overall policy on wage incentives broadly: "The approval of a wage incentive proposal by WLB is not an approval of the technical details of the plan. It does not signify that such a program is deemed by the board to be sound in concept. Neither does it mean that the board feels that it will increase production. The full responsibility for such matters must be assumed by those who develop the wage incentive program. The sole function of the board is to analyze the relation of any proposed plan to the economic stabilization program. The WLB will ordinarily require a periodic review of such plans in the light of changing conditions."

The plan submitted by Grumman would establish a standard of production efficiency of .48 lb. of airframe per man hour actually worked with the rate of incentive payment remaining constant regardless of output increase, above the standard. The incentive payments are to be applied to the hours paid rather than to the normal work hours in the incentive period. A five cent an hour increase is to be added to the base pay of each employee entitled to participate, effective Sept. 1.

CIO members in their opinion stated that it is possible that production may be approved in some plants by the introduction of properly established incentive systems. They indicated that this decision should be considered only as a tentative step not as a general guide for new incentive systems.

Carl Shipley, representing CIO, said that CIO does not oppose the overall plant-wide incentive system so long as it does not lead to the old-time incentive methods, the reduction in pay and the speed-up.

COMING EVENTS

Oct. 5, 6, 7—National Safety Congress, Chicago.
Oct. 11, 12—American Society of Tool Engineers, Indianapolis.
Oct. 13 to 16—The Electrochemical Society, Inc., New York.
Oct. 14, 15—American Machine Tool Distributors' Association, Montebello, P. Q., Canada.
Oct. 18 to 22—National Metal Congress and Exposition, Chicago.
Nov. 10, 11—Industrial Hygiene Foundation, Pittsburgh.

o o o

WPB Urging Work Incentive Plans

Chicago

• • • **In an address** before the Chicago Association of Commerce John W. Nickerson, director of the Management Consultant Division of the War Production Board, declared that production results demonstrate that properly designed and operated incentive plans can benefit labor, management and the nation through increased productivity and increased utilization of labor.

"Incentive wage plans must be tailored locally to fit a particular plant," he said, emphasizing that "a plan may be a dynamic and constructive force for production if properly administered or it may be a means of disrupting labor relations and actually lowering production."

He pointed out that both management and labor share government's interest in wage incentives because they constitute one specific method to compensate financially the extra effort which workers are being called upon to make to increase unit production so needed now because of the diminishing supply of new workers.

o o o

48-Hr. Week 85% Complete in South

Birmingham

• • • **An estimated 85 per cent** of all employees in the Birmingham District's iron and steel industry who are affected by General Order No. 8 (minimum wartime work week) are now working a minimum of 48 hr. a week. The remainder is affected by directives pertaining to the allocation of steel.

The company in this area to comply most recently with the minimum work week is the Kilby Steel Co. at Anniston. Due to the small number of men involved it was difficult for the company to change from a 40-hr. to a 48-hr. schedule without disrupting the shift plans and team work of the shifts. However, through the cooperation of labor and management and the War Manpower Commission the "Kilby Plan" has been put in effect.

Under this plan the monthly work schedule is posted in the plant by names and occupations thereby permitting employees to see exactly where and when they work each day of the month.

The employees also see the names of other members on their shifts and the direct schedule of upgrading of jobs. From this plan the War Manpower Commission expects better team work to assist workability of the plant's incentive plan and also to serve as a direct check on absenteeism with resultant increase in overall efficiency and production.

•

Current Thinking About Manpower

Excerpts from addresses given before the American Management Association meeting in New York.

". . . If we are to be successful in supplying the manpower required to meet the needs of the armed forces as well as to maintain a minimum civilian economy, we must stabilize the labor force of the United States to a far greater degree than it is now stabilized." *(Lawrence A. Appley, WMC executive director.)*

•

". . . The future of free American industry hinges upon whether management is able to recapture the confidence of labor it once enjoyed." *(Guy B. Arthur, personnel director, American Thread Co.)*

•

". . . The fear of insecurity must be banished from the workers' mind. If we run to government, then government will soon run us." *(Eric Johnston, president U. S. Chamber of Commerce.)*

•

". . . I doubt if management and labor are smart enough to plan for themselves. But if they do not, government will plan for them—and the planning will be for state socialism." *(An anonymous university president quoted by Eric Johnston, president of U. S. Chamber of Commerce.)*

Weirton Processing Brass

(*Continued from Page* 104)

an inch with two thousand being the maximim for over and under gage. The width must be exact—four and 27/32 in.

Weirton's achievement is considered outstanding in view of the doubt heretofore that steel mills could be used for brass rolling. Thus the use of mass steel production units for this operation may have some effect upon the finishing setup at brass mills. In the meantime, however, there seems to be no tendency on the part of steel companies to enter this field.

Briefly, the procedure at Weirton is as follows: Brass slabs are hot rolled on a structural mill and reduced from about 4½ in. to about ½ in. The material is then "skinned" or machined and sent to the cold strip mill which takes it down to the desired gage in two passes now (one pass will suffice when a new mill is ready). The brass plate is then cleaned, slit annealed, pickled and inspected.

Screwdriver Magic? Yes!

To the man in the field . . . the battle field, the farm field, the flying field; out on the highways and byways of the world . . . the humble screwdriver is a stand-by.

Modern high speed assembly lines, using CLUTCH HEAD SCREWS to "button up" implements and machines of war and peace, do not overlook the problems of this man in the field. They know that the Center Pivot Assembly Bit they use is twin brother to this standard type screwdriver . . . *virtually a magic wand* that unlocks the security of CLUTCH HEAD SCREWS when field repair or adjustment is a critical need.

CLUTCH HEAD SCREWS, as used today in vital war service, meet all the essential demands for speed, safety, security, and lowered costs in modern assembly . . . *plus the exclusive facility that they operate with ordinary type screwdrivers.*

United invites you to send for fully illustrated CLUTCH HEAD Brochure . . . also for package assortment and sample Center Pivot Assembly Bit.

CLUTCH HEADS are the most modern screws on the market today. They have definite exclusive advantages that make them preferred on assembly lines using Standard or Thread-forming types for every purpose.

CLUTCH HEAD · SCREWS ·

There is important economy in the long total life of this rugged Center Pivot Assembly Bit. A brief application of end surface to a grinding wheel restores original efficiency. No "back-to-the-factory" shipment for reconditioning.

UNITED SCREW AND BOLT CORPORATION

CHICAGO CLEVELAND NEW YORK

Limited Coordinated Authorization Procedure Expected; Functions Explained

Washington

• • • **The War Production Board** is slated soon to announce the new Coordinated Authorization Procedure, long rumored on the rim of issuance, according to a report from steel observers here. The long awaited CAP was originally designed to provide authorization to purchase non-controlled and specially controlled materials of all types through one coordinated procedure. Opposition to the breadth of this list presumably has held up issuance of the plan and latest information now suggests that the new CAP will control only a certain few materials for the present.

CAP is designed to (1) authorize manufacturers to purchase materials in quantities which are integrated with production requirements; (2) to relieve the burden of making repeated applications for production materials necessary to carry out a single production schedule; and (3) to permit simultaneous review of all non-controlled material requirements, based on production schedules authorized under CMP.

CAP is designed to eliminate the necessity on the part of manufacturers for filing numerous applications in order to obtain all of the materials necessary to meet a single authorized production schedule. Adoption of CAP would mean that only two forms would be required to meet an authorized schedule; (1) CMP-4A, or PD-870, and (2) the CAP Form.

The CAP form would be filed quarterly, thus placing all production material applications on a monthly basis. Plan calls for applications to be classified into two groups: (1) large quantity applications and (2) small quantity applications. The large quantity applications which account for the bulk of materials, would be handled on an individual case basis. The smaller quantity applications, which are more numerous, would be handled on a mass basis. A liberal small requirements provision is contemplated, in order to make materials available to such small users without specific applications.

o o o

Rated MRO Affected by P-89 Change

Washington

• • • **WPB last week amended** Preference Rating Order P-89, govering maintenance, repair and operating supplies to conform with Priorities Regulation 3, which covers the uniform method of application and extension of preference ratings.

The amended order provides that in the case of rearrangement of an existing installation, or in the case of adaptation of an existing installation to a different process, only the material added to the existing installation need be considered in computing the $500 limit on minor capital additions.

The revised order adds a new subparagraph in paragraph (g) so that the lists attached to Priorities Regulation 3 will limit the use of P-89 ratings, instead of specifying various prohibited articles in P-89. It also continues the quotas which have already been established for the fourth quarter of 1943 under the system which existed previously.

A flat AA-1 rating and allotment symbol MRO P-89 are provided after Jan. 1, 1944, small order exemption for purchases of aluminum in any quarter has been raised from 100 to 500 lb.

o o o

Farm Machine Outlook Improved

Washington

• • • **The War Food Administration** last week announced a new farm machinery distribution program which provides for actual rationing of considerably fewer items than in 1943 and in general sets up a much more flexible system for distributing the relatively greater amount of machinery to be available to farmers in 1944.

Production and distribution in 1943 made it necessary to put controls in effect on 91 types of machinery. The new program provides for distribution control over only 46 types of machinery, of which only 31 are actually on the list of rationed items.

Production of machinery under WPB order L-257 is authorized at an average of 80 per cent of the output in 1940, a better than normal production year. This compares with the authorized output of 40 per cent of 1940 under WPB order L-170, which governed production for 1943. Furthermore, there are no quota restrictions on manufacture of repair parts for 1944.

The new program takes force under Food Production Order No. 14 and Supplement 1 to the order, both effective Oct. 15. The order sets up three schedules of machinery—Schedules I, II and III, methods of distribution for each schedule, and establishes a national reserve equal to 20 per cent of the authorized production of the items in the three schedules.

Priority Changes

E-5-a—Amended order limits distribution of a designated list of gages and precision measuring hand tools to purchases having a rating of A-9 or higher. (9-27-43)

•

L-29—Amend. 3 removes illuminated exit signs of the type normally used in public buildings from restrictions of the order and makes them subject to provisions of Order L-212. (9-28-43)

•

L-79—Amended order clarifies restrictions on the sale and delivery of plumbing and heating equipment in question and answer form. (9-28-43)

•

L-158—Int. 1 makes clear that engine pistons and bearings for automotive vehicles may be finished in intermediate sizes not specified in the order when they are ordered from factory branches or warehouses wholly owned or controlled by producers for immediate use in a specific engine. (10-1-43)

•

L-190—Sched. II to IX imposes comprehensive standardization measures on production of large capacity scales used primarily for commercial purposes. (9-28-43)

•

L-197—Amended order tightens and simplifies controls over steel drums. (10-2-43)

•

L-225—Amended order permits rigid electrical conduit and electrical metallic tubing to be used to suspend industrial lighting fixtures of any weight. (10-1-43)

•

L-318—Amend. I corrects an error in the definition of Morse taper fittings. The amendment deletes any allowable tolerance from the definition of taper per foot. (10-1-43)

•

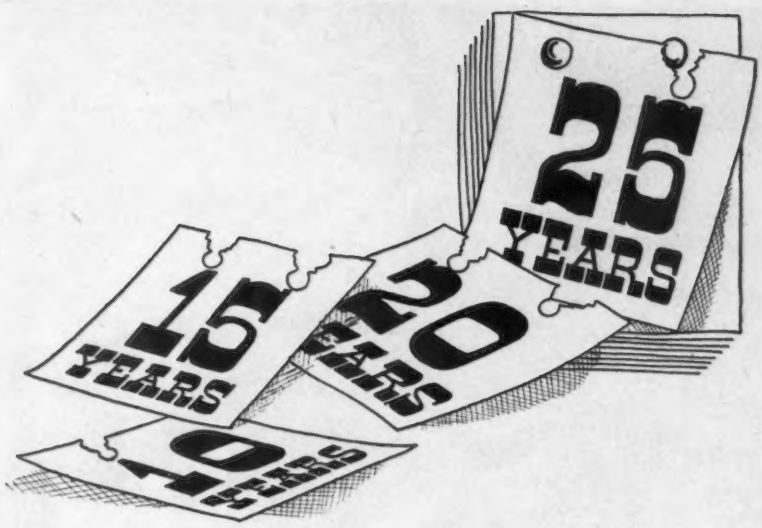
M-11-b—Revised order sets the use of zinc for making items not specifically prohibited in List A attached to the order at 15 per cent by weight per quarter of the amount of zinc products used by a person during the entire calendar year 1941. (10-1-434

•

M-21-a—Dir. 1 supersedes the instructions contained in Dir. 16 to CMP Reg. 1 relating to the replacement of rejected corrosion and heat resistant alloy steel, and imposes stricter controls. (10-2-43)

•

M-293—Int. I rules that provisions of the order with respect to Class Z products, apply even though orders for the products were placed prior to Sept. 24. (10-2-43)



Remember 1918?

Offhand you may not remember much of 1918 except that this was the year in which the first world war ended.

The chances are that you won't remember that that was the year in which modern high speed steel broaching was born—with the founding of Colonial Broach Company.

Few people cared—few realized the tremendous impact this new development would have on the future of metal working.

As a matter of fact it is our belief that few realize even today the place that broaching already occupies and will occupy in the near future—as the fastest and most accurate method of performing thousands of machining operations.

25TH colonial ANNIVERSARY 1918 1943

As a guide perhaps to the future, whether it be for war or for the peace to follow, Colonial has recorded in the Silver Anniversary issue of Broaching News the history of modern broaching development.

We would like to send you a copy. Ask for Broaching News Vol. V No. 3.

Originators of H. S. S. Broaching

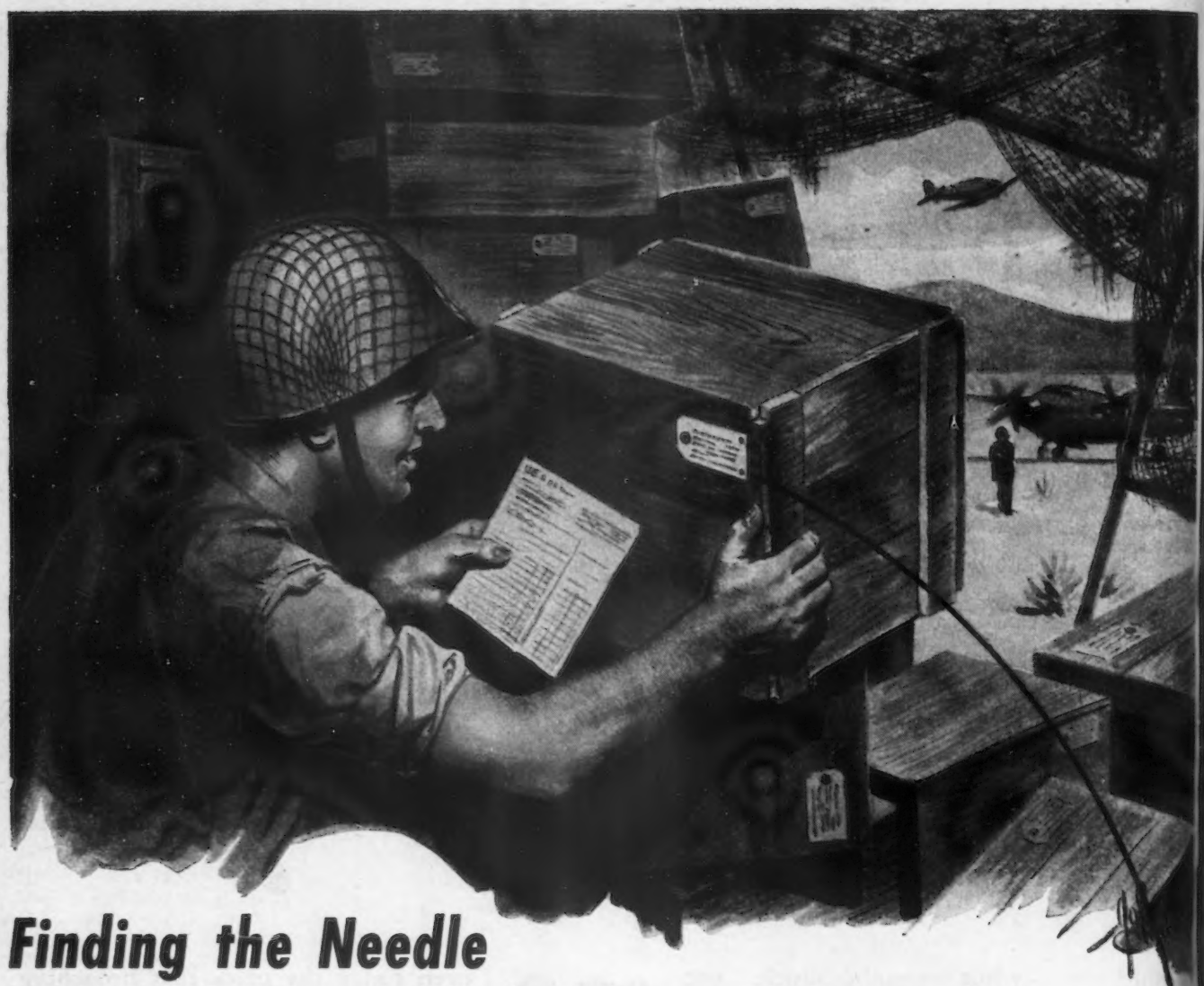
colonial BROACH COMPANY

25th Anniversary

DETROIT 13, U.S.A.

Broaches Broaching Machines - Broaching Equipment

BUY U.S. BONDS STAMPS



Finding the Needle in a North African Haystack

YOU'RE a bomber's nurse in North Africa and you need a new oxygen control valve for your plane. That's one of 250,000 parts in air force stocks.

You'll find it in a few seconds.

When spare parts come to a supply depot, an Addressograph* plate is embossed, giving a complete description of the part, and the number of the bin in which it will be stored. An impression of that plate goes into the depot's stock records, another goes on the bin, another is attached to the part itself. Then when parts are ordered, they can be located and shipped out quickly—and identified anywhere.

You get your bomber into the air quicker and always with the right repair because of an Addressograph plate—the same kind you use in your business to write payrolls, purchase orders and invoices, for tool crib control, or any of the hundred ways Addressograph methods are used.

Years ago Addressographs were employed to address envelopes. They still are, but business men soon began using this quick, always-accurate way of writing information in scores and then hundreds of new ways. Teamed with Addressograph are Multigraph* and Multilith* methods. Together they can make 80% of all paper work of business simpler, faster, more accurate, more economical. We'll prove it in your own case, with equipment you already have. Write or call the Addressograph-Multigraph Corporation—Cleveland and all principal cities of the world.

*T. M. Reg. U. S. Pat. Off.

Addressograph

TRADE-MARK REG U.S PAT OFF

SIMPLIFIED BUSINESS METHODS

LINES BEHIND THE LINES

"PLENTY! RIGHT NOW!" IS THE AIRCRAFT INDUSTRY'S SLOGAN —FROM PRODUCTION LINES TO FIRING LINES WITH SPEED!

Confronted with the necessity of mass production, the aircraft industry quickly sought and quickly found new methods to machine precision parts at a production rate. Broaching is becoming more and more aviation's way of meeting split second schedules. Broaching — a better way to do many metal working jobs — is the only *right* way to do some!

Cutaway view of Eaton aircraft fuel pump shows distinctive rotor principle, depending for efficiency on accurate fitting.

Teeth in outer rotor are broached on a standard American hydraulic broaching machine. American broaching tools, designed specifically for the task, provide high output at economical cost. American's *complete* broaching service—machines, tools, and engineering — makes war production more efficient, post-war production more profitable.

BROACHING IS BETTER THE *American* WAY

American
BROACH AND MACHINE CO.

ANN ARBOR, MICHIGAN

BROACHING MACHINES
PRESSES
BROACHING TOOLS
SPECIAL MACHINERY

DIVISION OF

Alloy Steel Rejects Strictly Controlled

Washington

• • • **The WPB on Monday** issued Direction 1 to Supplementary Order M-21-a superseding the instructions contained in Direction 16 to CMP Regulation No. 1, relating to the replacement of rejected corrosion and heat resistant alloy steel.

A producer must report immediately to the Steel Division of WPB any steel which cannot be applied to an order previously approved, along with reasons why it cannot be applied. No producer may apply such steel to an order not approved for melting on form WPB 2933 without specific authorization in writing from WPB. Also, a producer must not melt a replacement heat of any such steel except when specifically authorized in writing by WPB.

o o o

Drum Purchases Eased by Amendment

Washington

• • • **WPB amended Order L-197** last Saturday to include controls over distribution and allocation of steel drums. Order M-255 which controlled allocation was revoked.

The consolidation of the orders makes it possible for all applicants who desire to buy drums to use one official form (WPB 3233), instead of the two or three previously required.

Over a hundred products are listed in Schedule A of the order. Products listed without an asterisk may not be packed in steel drums. Items marked with an asterisk may be packed in old used drums.

•

Price Revision Set on Steel Valve Sales by MRC

Washington

• • • **The OPA announced** a revision of the method of establishing prices and freight charges applicable to the sale of new steel valves by MRC under the WPB program 2884. The revised order, No. 23 to GMPR, established the maximum price as the net price which a consumer-holder would be required to pay the steel valve manufacturer, under applicable OPA price measures, to obtain delivery of a similar valve to the same place from which a surplus valve is to be sold and provides that the MRC shall pay all freight charges incurred in delivering the surplus steel valve from the consumer-holder to the point desginated by MRC.

•

All M-293 Orders Must Comply, WPB Rules

• • • **Provisions of General** Scheduling Order M-293, with respect to Class Z products, apply even though orders for the products were placed prior to Sept. 24, its effective date, the WPB announced in Interpretation No. 1.

In such cases, if a Claimant Agency requires that the order for a Class Z product be "accompanied" by a form, the provisions of M-293 will be met if a manufacturer files the form as soon as practicable after receiving instructions to do so.

Manufacturers of Class Z products, who have received purchase orders which are subsequently covered by a form, must comply with the instructions accompanying it. If the manufacturer received the form before September 24, he may comply with these instructions by returning it as promptly as practicable.

•

Dollars and Cents Prices Established for Cast Iron Pipe

Washington

• • • **OPA has provided** maximum dollars-and-cents prices for an alternate specification of cast-iron bell and spigot pressure pipe to reflect the savings brought about by a reduction of metal content.

The ceilings apply to cast-iron pressure pipe meeting the Emergency Alternate Federal Specification E-WW-P-421 issued by the National Bureau of Standards on Dec. 21, 1942.

The method used to determine the delivered ceilings for the pipe covered by the action is to provide the manufacturers with specific cents-per-lineal-feet deductions which must be made from the maximum prices previously established for heavyweight pressure pipe in Maximum Price Regulation 188.

In addition, specific zone allowances, which reflect resulting savings in freight, must be deducted on sales of the lightweight pipe.

The allowances, including freight per lineal feet, are listed in Amendment No. 16 to Order A-1 of Regulation 188, effective Sept. 30.

•

Increase Cap Screw Prices

• • • **What amounts to a** substantial increase in the price of ¾ in., 1035, double heat treated cap screws was allowed by OPA recently when ceiling discounts from list prices for this diameter was lifted to the same as those prevailing for ⅞ in. diameter cap screws. The increase was effected through amendment 2 to MPR 147, effective Sept. 14.

Additional CMP Developments

• Dir. 1 to Reg. 5a has been revoked.

•

• Dir. 33 to Reg. 1 lightens restrictions on small orders of aluminum shapes.

New WPB Forms

WPB-732—Report of operations due Oct. 25, 1943.

WPB-1801—Electric motors and generators.

WPB-1857—Silver: Smelters' and refiners' monthly report on stocks and operations.

WPB-1902—List of products to be manufactured under simplified schedules in effect.

WPB-2633—Steel producers' monthly report of shipments and past due orders controlled carbon steel (including wrought iron) and alloy steel products, excluding steel castings.

WPB-2779—Manufactured crude abrasive: Application for authority to accept delivery.

WPB-2783—Manufactured crude abrasive (silicon carbide and fused aluminum oxide): Producers' and importers' proposed bimonthly schedule of domestic production and/or importation and monthly summary of production and shipments.

WPB-2953—Copper wire mills: Application for refined copper and for authorization to purchase and sell intermediate shapes.

WPB-3003—Scheduled products.

WPB-3007—Copper and copper-base alloy brass mill: Warehouse shipment report.

WPB-3112—Brass mills: Application for copper, copper-base alloy ingot and scrap.

WPB-3400—Scheduled products.

WPB-3401—Scheduled products.

Price Briefs

• Amend. 100 to MPR 136 expands the provisions for automatic adjustments of maximum prices for wholesalers of machines and machinery parts to cover wholesalers who are supplied by sellers other than manufacturers. (Release No. OPA-T-1262)

•

• Amend. 12 to MPR 134 establishes a limitation on settlements made between lessors and lessees for the value of construction and road maintenance equipment which has been lost or damaged during a rental period. (Release No. OPA-T-1242)

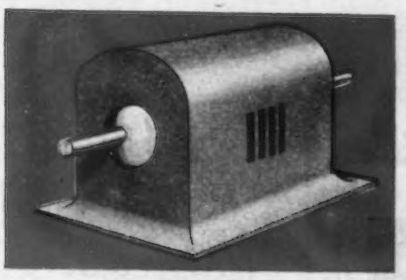
•

• Order A-1, Amend. 16 to MPR 188 provides maximum dollar and cents prices for an alternate specification of cast-iron bell and spigot pressure pipe to reflect the savings brought about by a reduction of metal content. (Release No. OPA-T-1282)

PARTS FOR FACTORY EQUIPMENT & MACHINERY

Advances in engineering and design and improved materials will make "The work shop of the world" a new vision of utilitarian beauty.

Pressed Metal Parts and stampings will be used for factory equipment and machinery in the future, just as they have been in the past, but to an accelerated degree. They will make possible revolutionary advances, due to their ability to stand up to abuse, resistance to shock, rugged strength, ability to withstand corrosive conditions, survive radical temperature changes, not to mention low cost and a score of other characteristics, providing requirements not met by any other material.



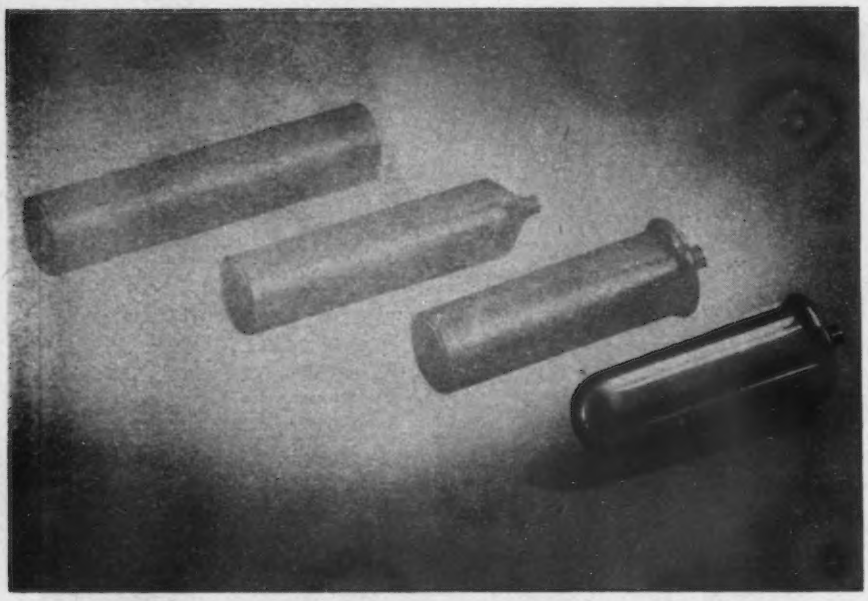
Sound safe designs literally demand fullest possible use of stampings. Call on the Parish Pressed Steel Company for engineering cooperation. Our services will be found helpful.

★ METAL STAMPINGS ★ MODERN DESIGN AT LOW COST ★

PARISH PRESSED STEEL CO. *Subsidiary of* **SPICER MFG. CORP.**

READING, PA.

Western Representative: F. Somers Peterson, 57 California St., San Francisco, Cal.



Anything like this
IN YOUR PLANT?

This tubular part is especially fabricated for use in the manufacture of a temperature indicator.

It is made of seamless copper tube 9/16" in diameter and has a wall thickness of .032". After the part is formed to the desired shape (specified by the customer) a length of capillary tube is brazed into one end.

Required for a definite purpose, it was designed by the user in collaboration with Wolverine tube-fabricating engineers. All specifications are being met and the job is in production.

If this piece reminds you of a similar problem of yours involving tube or tubular parts, call Wolverine Tube Division for consultation and quotation. We have hundreds of standard tools already on hand for making parts and assemblies similar to the part shown here, along with a wealth of experience in handling seamless tube.

Or if you prefer to make the part yourself, call on Wolverine anyway as a source for tube that will be uniformly high in quality and possess the right properties for fabricating. Also consult our engineers regarding types of tools, methods, and techniques. Their talents and services are yours for no cost.

DEFINITIONS

MELTING FURNACE is a refractory-lined metal shell in which metals can be heated to a temperature exceeding their melting points for ease of casting into desired shapes.

• Our new address is Detroit 9, Mich.

BUY WAR BONDS

CALUMET AND HECLA CONSOLIDATED COPPER COMPANY
WOLVERINE TUBE DIVISION
Seamless Copper — Brass
1441 CENTRAL AVENUE DETROIT, MICHIGAN

Shortage of Labor Causes Unemployment

• • • Here's an example of how the labor shortage results in layoffs. Homelite Inc., of East Port Chester, Conn., was reported to have laid off 175 workers last week because the company lacked ball bearings. Paradoxically, the company was unable to obtain its full supply of ball bearings because bearing makers are experiencing a labor shortage, according to the explanation of a Homelite official who said his firm did not want to hoard labor and had sought jobs in nearby plants for the laid-off persons.

Society Formed by Welding Distributors

Chicago

• • • On Sept. 20-22, executives of welding equipment and supply houses met at the Lake Shore Club of Chicago to form an association of welding distributors. These men came from all sections of the country and were representatives of houses with a national reputation in the welding supply field.

The group selected the name, "Welding Distributors Association," and drew up a constitution and set of by-laws which were voted upon and adopted unanimously by the conferees. At the same time officers and directors of the new organization were elected. The officers, who are also directors, are: President, T. A. Jones, Arc-Way Equipment Co., Philadelphia; vice-president, Mark Cobb, Welding Engineering & Sales Corp., New York; secretary-treasurer, W. H. Simmons, Welding Sales & Engineering, Detroit. Directors are: E. S. Daniels, Victor Equipment Co., San Mateo, Cal.; F. P. Kohlbry, Machinery and Welder Corp., St. Louis, and C. E. Whitehead, Wessendorff, Nelms & Co., Houston.

The main purpose for the founding of this national association, according to a spokesman for the group, is to provide some means whereby distributors of welding equipment and supplies may freely exchange information about problems common to all. The association, this spokesman added, also plans to take an active part in bringing to the attention of all industry, now and in the post-war period, the many benefits which industry can derive by a wider use of welding.

Rust CAN'T TOUCH HARPER BOLTS

HARPER Fastenings resist rust, corrosion, salt laden air and other deep sea troubles. They're made of non-ferrous and stainless alloys. Today they are doing Trojan duty on battle ships, cruisers, aircraft carriers, PT boats, landing boats, submarines and many other types of vessels.

Because they are rust and corrosion resistant, Harper fastenings withstand severe conditions in the chemical, food, utilities and numerous other industries. In the proper alloys they are non-magnetic, non-sparking, repeatedly removable and have other sterling properties.

4320 STOCK ITEMS

. . . of bolts, nuts, screws, washers, rivets and accessories in the non-ferrous and stainless alloys.

Brass
Bronze
Copper
Everdur
Monel
Stainless

THE H. M. HARPER COMPANY, 2607 Fletcher Street, Chicago, Illinois

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HARPER

EVERLASTING FASTENINGS

Add to the life of your tools..*at lower cost*..with the substantial, accurate **DELTA Toolmaker Surface Grinder**

"A heck of a lot of machine for the money," say delighted users . . .

You make a big saving on initial cost—and get dependable, trouble-free results over a long, useful life — with this husky, big-capacity grinder. It is ideal for surface grinding, tool sharpening, etc.

Designed for speed and ease of operation. Convenient controls . . . wide graduations on micrometer for close settings. . . . unique wheel adapter that saves on "truing-up" operations . . . many other features that assure you of creditable performance.

Call your industrial distributor (Delta sells only through distributors) today.

Write for catalog.

M-4B

Specifications

Heavy enough for production work (over 6 feet high, weight close to 700 lbs.).

Wheel 7x1½", 1¼" bore; minimum cup wheel 3½" dia.

Capacity (under 7" wheel) 9½" to table — 6" to Browne & Sharpe No. 510 Magnetic Chuck (not furnished).

Maximum surface that can be ground: Length 13½", width 6" (table surface 5¾x13")

Hand operated.

Traverse feed, one graduation is .001".

Coarse vertical adjustment (wheel at top left), 9½" range.

Micrometer adjustment ⅜" range, each graduation is .0005".

Two spindle speeds: 3200 or 4200 r.p.m. with 60 cy. motor.

No. 24-105 **$295.00 f.o.b. Milwaukee without wheel, motor, or switch. PD-1A priority required.**

Tear out..and mail the coupon today!

DELTA MILWAUKEE Machine Tools

DRILL PRESSES — GRINDERS — CUT-OFF MACHINES — BAND SAWS — ABRASIVE FINISHING MACHINES...

THE DELTA MANUFACTURING CO.
704L E. Vienna Avenue, Milwaukee 1, Wisconsin

Please send me your new catalog giving full details on the Delta Toolmaker Surface Grinder and your full line of low-cost machine tools.

Name.....Position.....

Company.....

Address.....

City.....(.....) State.....

Fuels Conference to Be Held Oct. 28, 2

Pittsburgh

• • • **The Annual Joint Fuels Confer**ence of A.S.M.E. Fuels Division an A.I.M.E. Coal Division, will be hel at the William Penn Hotel in Pitts burgh, Oct. 28-29.

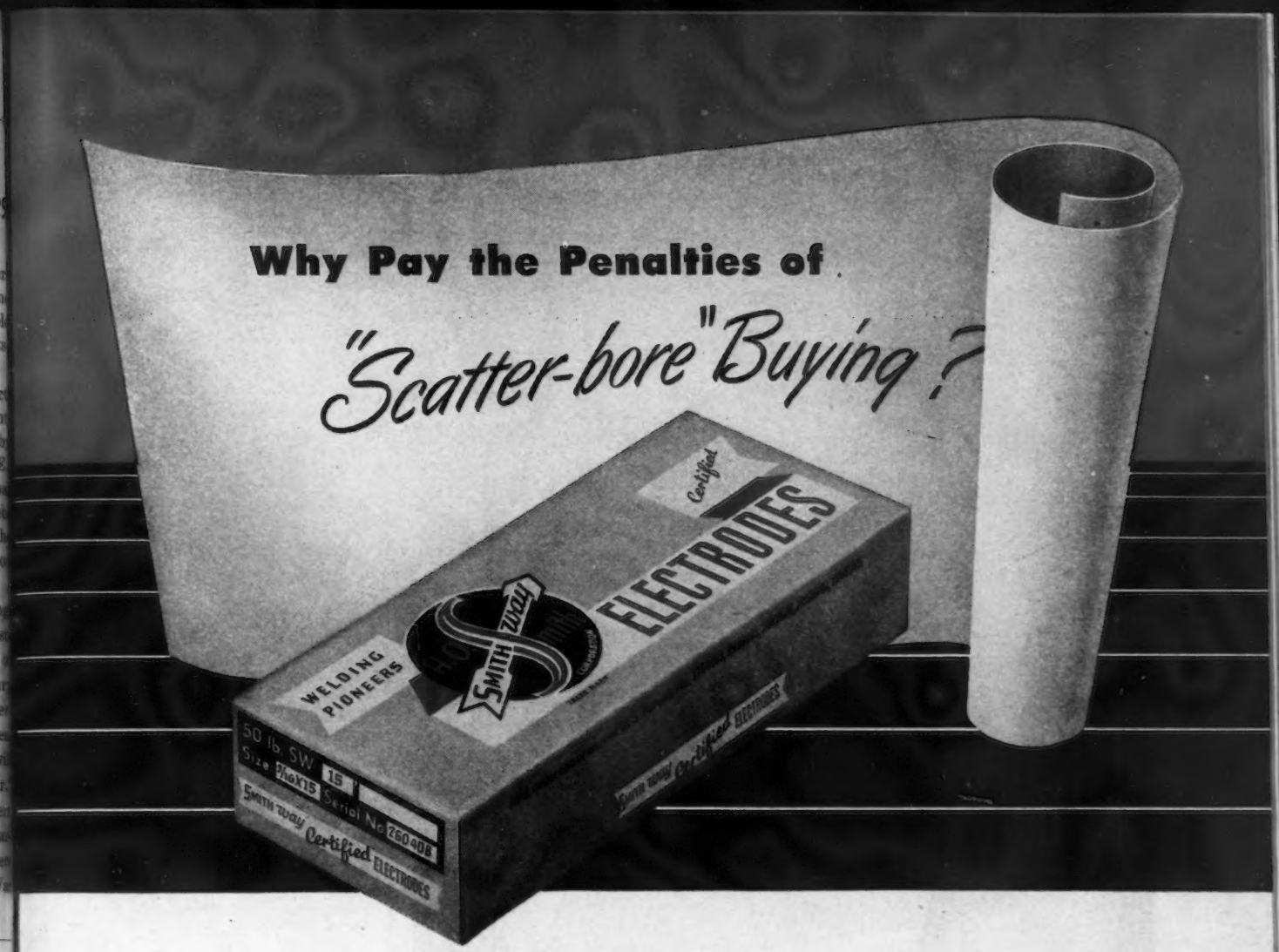
After the welcoming address, Oc 28, by Harry M. Moses, presiden H. C. Frick Coke Co., and response b Harold V. Coes, president of A.S.M.E there is a technical session on co research. At the luncheon, H. F. He ley will speak on Australia. In th afternoon, there is a technical sessio on mining management.

At the banquet Thursday evenin Oct. 28, of which T. E. Purcell is toas master, there will be a presentation the Percy Nicholls Award to Henr Kreisinger of Combustion Enginee ing Co., and General E. P. Sorense assistant chief, Army Air Force, w speak on "Application of Air Power.

On Friday morning, Oct. 29, the is a technical session on gas and ca bonization. In the afternoon, the will be a technical session on the "W Program."

NEW RECORDING DEVICE: Marvi Camras, assistant physicist of th Armour Research Foundation, Illi nois Institute of Technology, wit his typewriter-size machine whic records sound on steel wire as thi as human hair by magnetizing th wire. An eight-hour continuous pro gram can be wound on a spool fiv in. in diameter and two in. wide

International News Photo



For years it has been common practice among buyers of welding electrodes to purchase from several different sources. We can understand that—for we remember when it was necessary to buy one type of electrode from one supplier, another from another, and so on, in order to get the best electrode for each and every type of welding.

But that time has passed. "Scatter-bore" buying is no longer necessary.

Today the line of SMITHway Certified Welding Electrodes includes electrodes for a wide range of welding applications. Each type of SMITHway electrode is equal to or better than any competitive type on the market. Therefore, you gain two distinct advantages by concentrating your purchases in this one line. First, and of most importance, you get the electrode that gives you the best results for your particular application. Second, you get the lowest prices by taking advantage of the highest single shipment allowance.

Mild Steel . . . High Tensile . . . and Stainless Steel

WELDING ELECTRODES

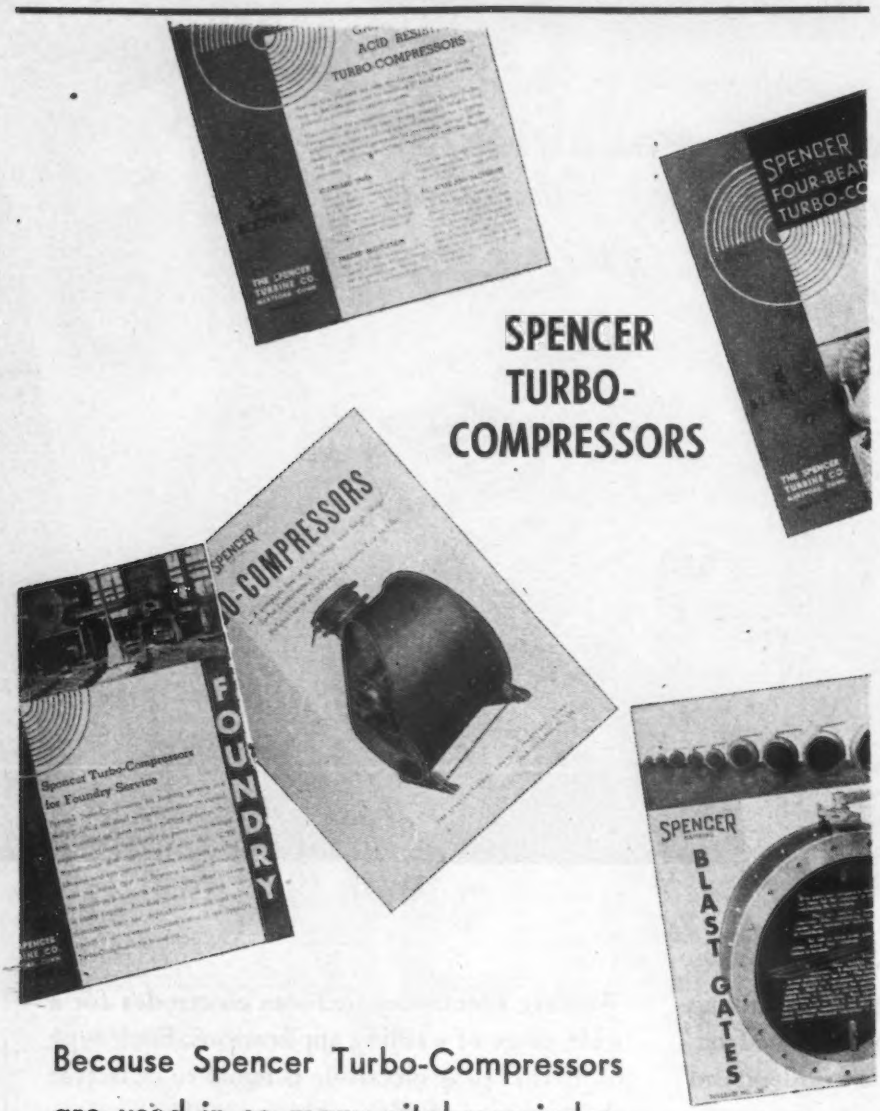
made by welders . . . for welders

SMITHway Welding Monitor *cuts training time . . . trains better welders in less time.*

SMITHway AC Welding Machine *eliminates arc blow, reduces spatter, increases production.*

A. O. SMITH *Corporation*

MILWAUKEE • WISCONSIN ★ HOUSTON • TEXAS



SPENCER TURBO-COMPRESSORS

Because Spencer Turbo-Compressors are used in so many vital war industries, we again offer to send any or all of our many technical bulletins.

They will help you maintain your present equipment; improve your present set-up, or plan for post-war changes.

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TURBO-COMPRESSOR BULLETINS
THE SPENCER TURBINE COMPANY • HARTFORD 6, CONN.
2471

Optical Group Meets on Applied Spectroscopy

Pittsburgh

• • • A feature of the Optical Society of America annual meeting here Oct. 7, 8 and 9, with headquarters at Webster Hall, will be a conference on Applied Spectroscopy. This conference is replacing those formerly held at M.I.T. and in the Midwest.

Of interest to steel research and other metallurgical workers will be the following papers, at the Mellon Institute Auditorium, Oct. 8:

"A Compendium of Operating Conditions Used in Spectrographic Analysis," Edwin S. Hodge, H. W. Dietert Co.

"Sampling, Mixing, and Grinding Techniques in the Preparation of Samples for Quantitative Analysis by X-Ray Diffraction and Spectrographic Methods," James W. Ballard, H. I. Oshry, and H. F. Schrenk, U. S. Bureau of Mines, Pittsburgh, Pa.

"Spectrographic Determination of Thorium in Tungsten Filament Wire," S. L. Parsons, Sylvania Electric Products, Inc.

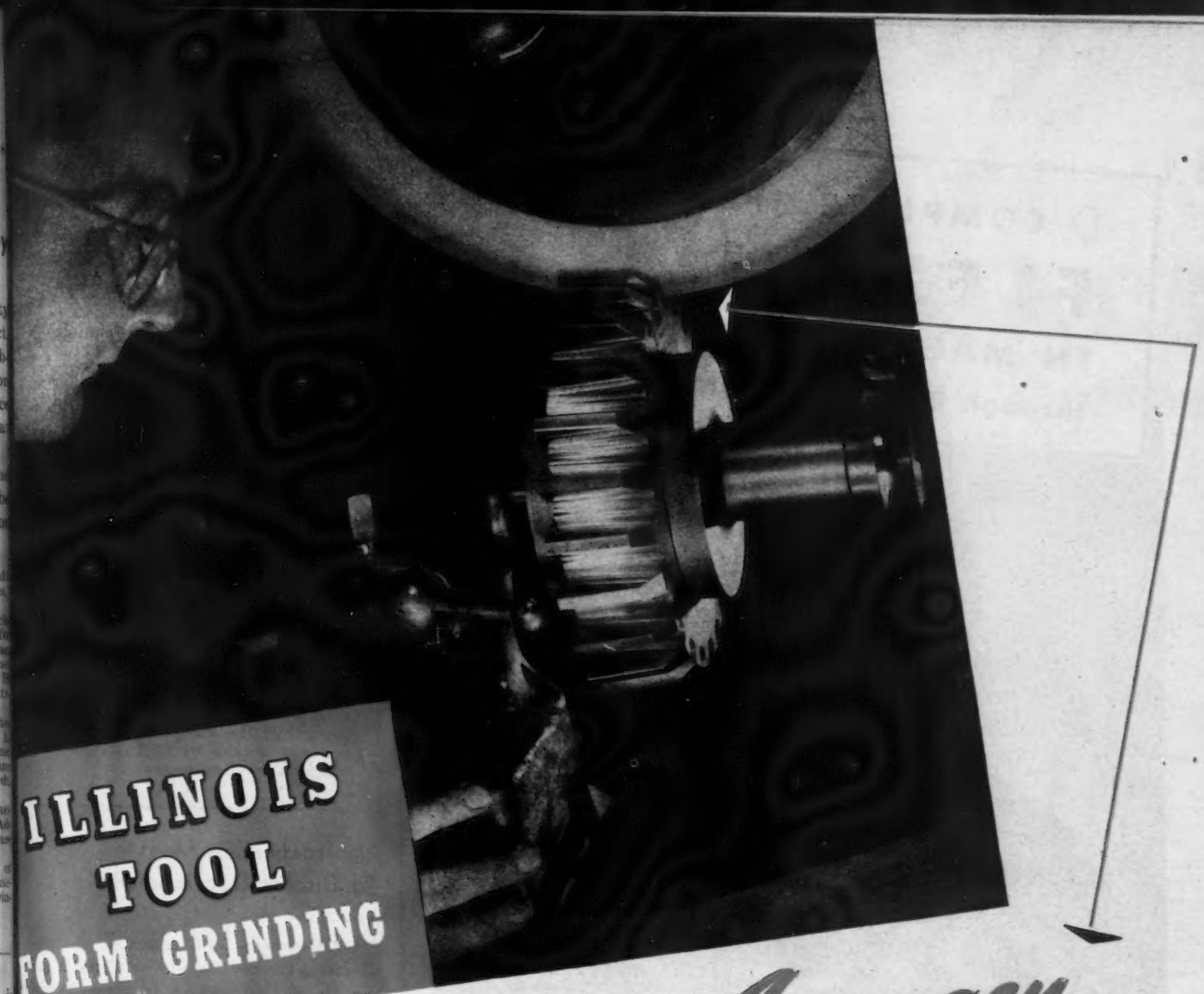
"Spectrographic Analysis of Magnesium Alloys," T. M. Hess and L. G. Reinhardt, Dow Chemical Co.

"Spectrographic Determination of Trace Elements in Cartridge Brass and Admiralty Brass," P. A. Leichtle, Chase Brass & Copper Co.

"The Spectrographic Determination of Small Amounts of Impurities in Magnesium Chloride," Mabel F. Wilson, Diamond Alkali Co.

AROUND-THE-CLOCK TESTING is needed to meet war production demands for gyro-compasses, vital instruments for naval and merchant marine ships. Under the close supervision of the Navy, Lucy Manzi, night shift inspector, checks a Sperry gyro-compass.

Acme Photo



ILLINOIS TOOL FORM GRINDING

His Responsibility . . . Accuracy

OVERNIGHT
TO ALL AMERICA . . .
FROM THE HUB OF
AIR TRANSPORTATION

A vital operation in the production of high speed metal cutting tools is the final form grinding. To produce the correct profile within the necessary close tolerances requires extreme skill and experience. To obtain accuracy of product it is essential to have tools which are engineered for the job and manufactured to a dependable degree of precision within the scope of modern inspection equipment.

For tools that are certain to give maximum efficiency and long life, specify ILLINITE.

ILLINITE
HIGH SPEED
METAL CUTTING TOOLS

- GROUND HOBS
- BROACHES
- SHAPER CUTTERS
- GEAR CUTTERS
- MILLING CUTTERS
- GROUND FORM TOOLS
- SPECIAL TOOLS

ILLINOIS TOOL WORKS

Manufacturers of Metal Cutting Tools and Shakeproof Products
2501 North Keeler Avenue, Chicago 39, Illinois
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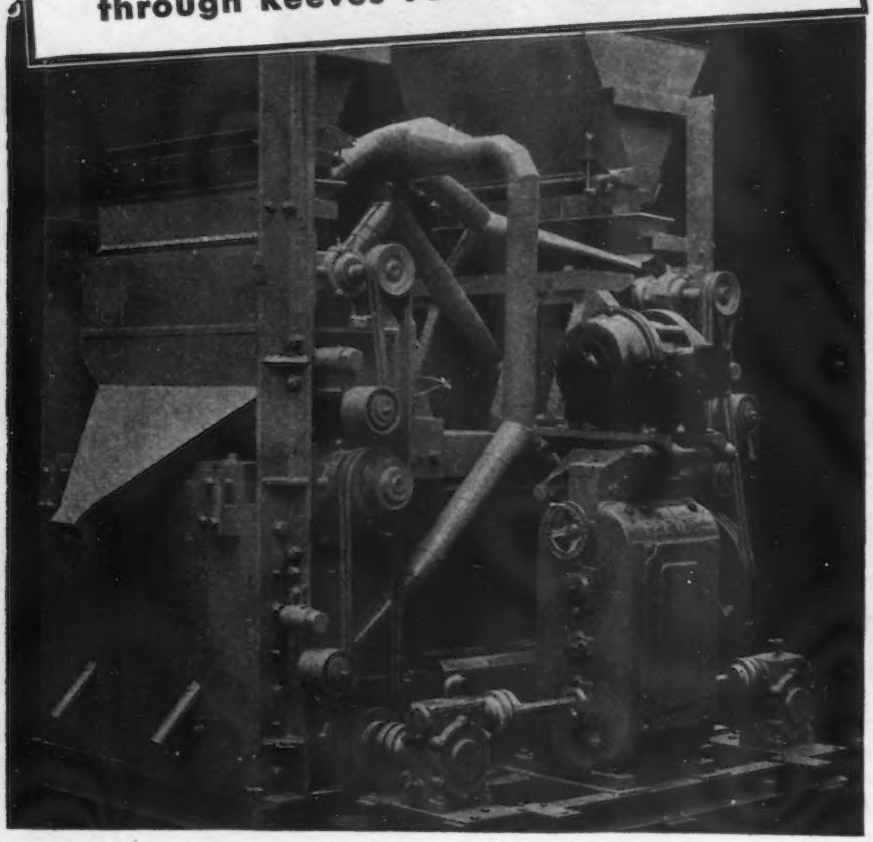
COMPLETE SPEED

FLEXIBILITY

IN MAGNETIC SEPARATION

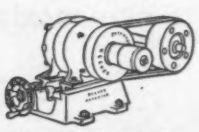
through Reeves Variable Speed Drive



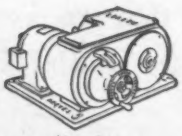
The magnetic separation and purification of different materials and different sizes of particles requires different separator speeds. This EXOLON Magnetic Separator is standardly equipped with a REEVES Variable Speed Transmission to provide complete speed flexibility and enable it to handle a wide range of materials and sizes. The REEVES drive enables the operator to get the correct speed for any separation merely by turning a handwheel—without stopping the machine. The result is more production—and greater uniformity—at lower cost. . . . REEVES Speed Control is standard equipment on leading makes of machines used in the chemical and process industries, and one of the three basic REEVES units can be quickly and inexpensively installed on machines in service. Write for Catalog-Manual I-419.

REEVES PULLEY COMPANY, COLUMBUS, INDIANA

Variable Speed Transmission



Vari-Speed Motor Pulley



Motodrive

Accurate Variable REEVES SPEED CONTROL

Morale Building Stopped Production

Boston

• • • Admission to the dance was 75c. and local union officials asked the Springfield Machine & Foundry Co. to close the shop six hours the night of the dance so the union could collect the fee from 420 workers. The company posted notice as requested. A wail went up from workers who don't or can't dance and would lose pay by the closing. They offered to pay the admission if the plant would keep open, but management felt the die was cast and the plant would remain closed during the dance. The company makes marine engines for freighters; is operated under the jurisdiction of the United States District Court of Philadelphia. Karl Fernstrom is chief operating officer of the company; the dance closing order was signed by O. P. Greenwood, works manager.

Electrochemists Meet To Discuss Developments

New York

• • • Members and guests of the Electrochemical Society will meet at the Hotel Commodore in New York, Oct. 13-16.

One session of the convention will be devoted to the revoutionary change in the tinning of steel used in the manufacture of tin cans from the old process of hot dipping to electrolytic plating. Experts in the field will meet in New York to report on their individual findings on the new process.

Alloy steels will be discussed by Dr. B. D. Saklatwalla of Pittsburgh, in his Richards' Memorial Lecture. He will stress in particular the essential constituent, vanadium, in modern steels which have made high strength combined with low weight possible.

Mr. Ivan S. Bloch, Market Development Chief, Bonneville Power Administration, Portland, Ore., will discourse on the new electrochemical centers developed during the war in Washington and Oregon.

Other sessions during the convention will be devoted to the electric discharge as a means of conversion into products highly essential to the war effort, details of which cannot be disclosed now.

The president of the society is Dr. R. M. Burns, Bell Telephone Laboratories.

They Bend the Shapes and Speed the Ships in Mills & Shipyards from Coast to Coast

KANE & ROACH

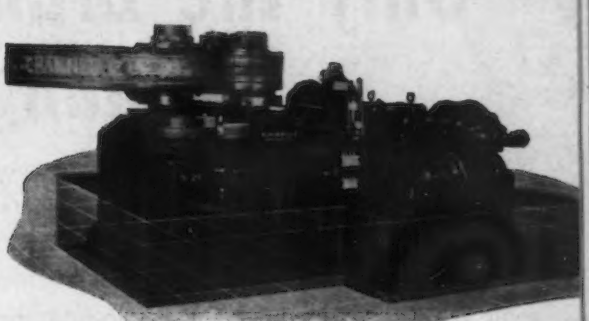
BENDING & FORMING ROLLS

East Coast, West Coast . . . Great Lakes t the Gulf! Wherever great steel interests make an shape steel—or fabricate it into Liberty ships— there you'll find Kane & Roach Bending an Forming Rolls. That's because Kane & Roac machines have proved themselves definitely su perior in handling the heavy angles, channel and special ship-structural shapes which th steel mills and shipyards must handle.

Kane & Roach May Be Able to Help You Solve Your Problems

Cooperation between Kane & Roach enginee and ship yard production executives have worke out practical solutions to scores of wartime meta forming problems. These highly satisfactory deve opments were not the work of guess or experimen but were based on the proved and recorded enginee ing data compiled during 55 years of Kane & Roac metal-forming experience. Let this valuable exper ence go to work on your problems. Write today Just tell us that you'd like a Kane & Roach engine to study your requirements and recommend a solu tion. No obligation entailed.

Congresswoman Katharine Edgar Byron of Maryland swung the champagne bottle as the S. S. Francis Scott Key slid down the ways to join the Liberty Fleet of the U. S. Maritime Commission. Kane & Roach Bending Rolls played a part in completing the hull on schedule.

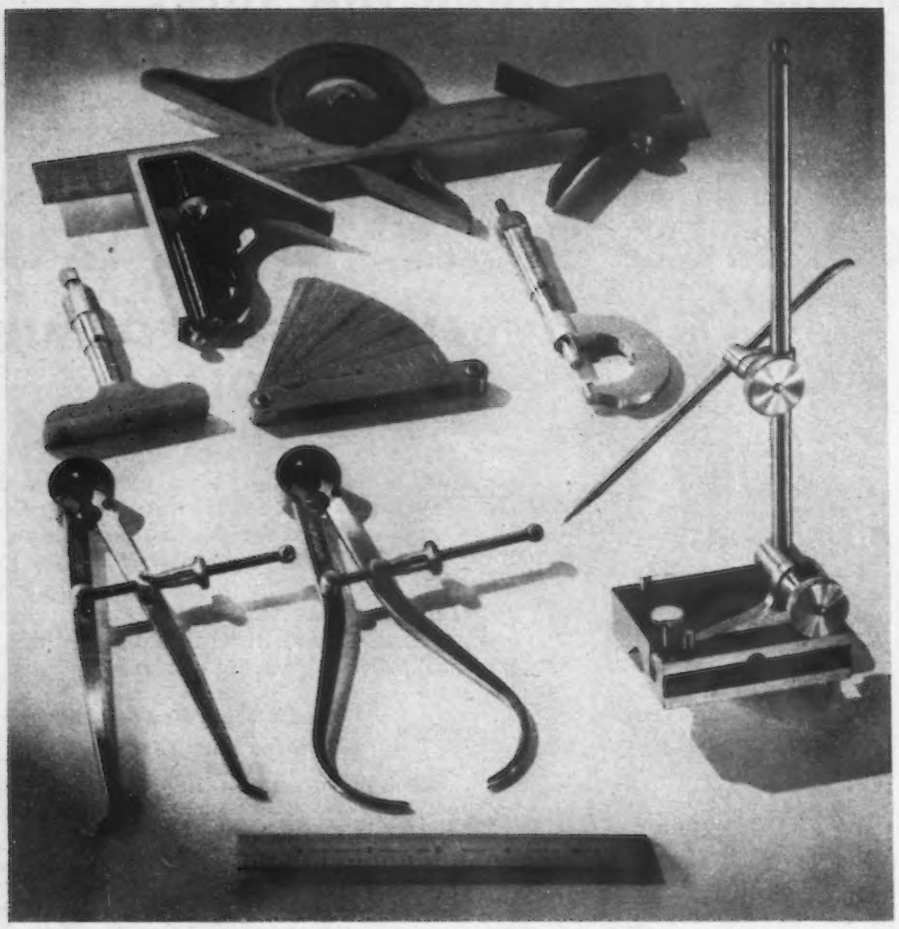


Even 12" x 5/8" shipbuilding channels and angles up to 6" x 6" x 1 are bent to precision shapes on this horizontal angle bende

KANE & ROACH, INC.
Syracuse, N. Y., U. S. A.

A Kane & Roach horizontal pyramid angle bender rolling true circles from 1" x 1" x ¼" to 5" x 5" x ½" angles at a shipbuilding yard.

A vertical Kane & Roach pyramid angle bender bending heavy angles up to 6" x 6" x 1" at a steel mill.



Only the *Brand Name* is Changed

Now going to work on precision jobs everywhere in American metalworking are fine new instruments bearing the Millers Falls name . . . and the old familiar Goodell-Pratt is no more. *But only the brand name is changed.* Actually, Millers Falls Company has been producing this equipment for some years. The difference now is two-fold: the famous Goodell-Pratt brand, retained on this line since the union of the companies, is yielding to the name of the present firm; and our production capacity has been materially enlarged.

As a result Millers Falls Precision Tools will be increasingly important to American metalworking. Built with Millers Falls traditional high regard for quality in design and production, they're unusually good values delivering long, dependably accurate service. Illustrated here are a few of the precision tools in Millers Falls' wartime line. Details on request.

Calipers and Dividers • Feeler Gauges • Surface Gauges • Micrometers
Depth Gauges • Combination Sets
Steel Rules • Center Gauges • Screw Pitch Gauges

MILLERS FALLS TOOLS
SINCE 1868

MILLERS FALLS COMPANY
GREENFIELD, MASS., U.S.A.

Four Pillars for Industrial Peace Cited by Girdler

• • • **Four pillars** required to support the nation's future industrial peace are specified by Tom M. Girdler in his autobiography, "Boot Straps," published by Charles Scribner's Sons. Mr. Girdler writes in collaboration with Boyden Sparkes.

From the experience which has carried him to the chairmanship of Republic Steel Corp. and of Consolidated Vultee Aircraft Corp., Mr. Girdler declares:

"In my thinking I see four main points for consideration when the country sets about the job of giving this country industrial peace.

First, recognition of the principle of collective bargaining.

Second, recognition of the right of employees to join or not to join any labor organizations.

Third, recognition that industrial relations are "human" relations, and further that cooperation between men and management naturally follows mutual understanding of each other's problems.

Fourth, legislation fairly designed to protect the rights of both employees and employers.

"Once we establish an arrangement for employment in industry which takes account of these main points, I believe they will become as pillars supporting a sound structure of industrial relationships."

Mr. Girdler reiterates that he approves of unions but disapproves of the abuse of power by union leaders.

On the subject of post-war opportunities, Mr. Girdler says every town and village in the United States will have an airmail pickup service after the war. However, he says suggestions that bulk freight is to be transported by air, even in trains of gliders, "is sheer nonsense and will be for many years."

•

• • • **An encyclopedia** of substitutes and synthetics edited by Morris D. Schoengold has been issued by the Philosophical Library, Inc., 15 East 40th Street, New York. It covers products which have been developed recently to replace critical materials. The price of the 390-page volume is $10.

U.S. WAR EXPENDITURES
DAILY RATE
MILLIONS OF DOLLARS
MILLIONS OF DOLLARS
JULY 1940-AUGUST 1943
400
300
200
100
0
J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1940
1941
1942
1943

YOU WEAR 'EM DOWN
I'LL BUILD 'EM UP!

Don't let the spare parts situation worry you. No matter how badly worn or damaged a part may be, put it back in service with arc welding. This is the kind of teamwork we'll have to use from now until the war is over.

Harcote's specialty is hard surfacing machinery parts, shovel teeth, scraper blades, farm implements — in fact, all kinds of applications on carbon steel, low alloy and high manganese surfaces. It makes parts last much longer than originally. Let Harcote save you time and money. Welding procedures on request.

The complete line of P&H Alloy Electrodes covers all needs for hard surfacing, resistance to wear, impact and abrasion, for welding stainless steels, 4-6% chrome steels, armor plate, etc.

P&H *Alloy* ELECTRODES

P&H builds a complete line of A.C. and D.C. Welders — all with single control. All P&H machines are rated on W.S.R. which is actual delivered output.

ARMY E NAVY

A new star has been added to P&H's award for excellence in war production.

General Office: 4401 W. National Avenue, Milwaukee, Wis.

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CORPORATION
WELDING ELECTRODES • MOTORS • HOISTS P&H ELECTRIC CRANES • ARC WELDERS • EXCAVATORS

Canadian Distribution: The Canadian Fairbanks-Morse Co., Ltd.

Yours for the asking

Page 46-47 How to Prevent Breakage of Taps and Drills

Page 42-43 Hints on Hand Filing

Page 4-5 How to Choose the Right Bolt Clipper

Page 6-7 Correct Cutting Technique

Page 44 How to Use the Ball Pein Hammer

Page 48 Cutting Angles on High Speed Bits

All this and a lot more practical shop information in this FREE book

JUST SEND A POSTCARD - Ask For PORTER'S TOOL MANUAL

ARMY E NAVY

HKP

PORTER CUTTERS

BOLT CLIPPERS — AUTOBODY REPAIR TOOLS — PRUNERS

H.K.PORTER, INC., 400 Ashland St., Everett 49, Mass.

ODT Barge Schedule Cut To Save 2400 Tons of Steel

Washington

• • • **The Office of Defense** Transportation has announced major revisions in its petroleum tank barge construction program which will save nearly 2400 tons of steel.

The announcement covers the deduction of 13 units from the steel tank barge schedule of 168 units and certain changes in the remainder of both the steel and the wood and composite barge schedules.

A 2390-ton saving in steel results from the elimination of the 13 steel tank barges, for which no steel has been rolled. Of the remaining 155 steel barges, 100 will be completed as tank barges and 55 are to be converted to dry-cargo units of the standard hopper type. Steel has been rolled for all of the 155 barges and fabrication is practically complete on 85 of the 100 to be completed as tank barges.

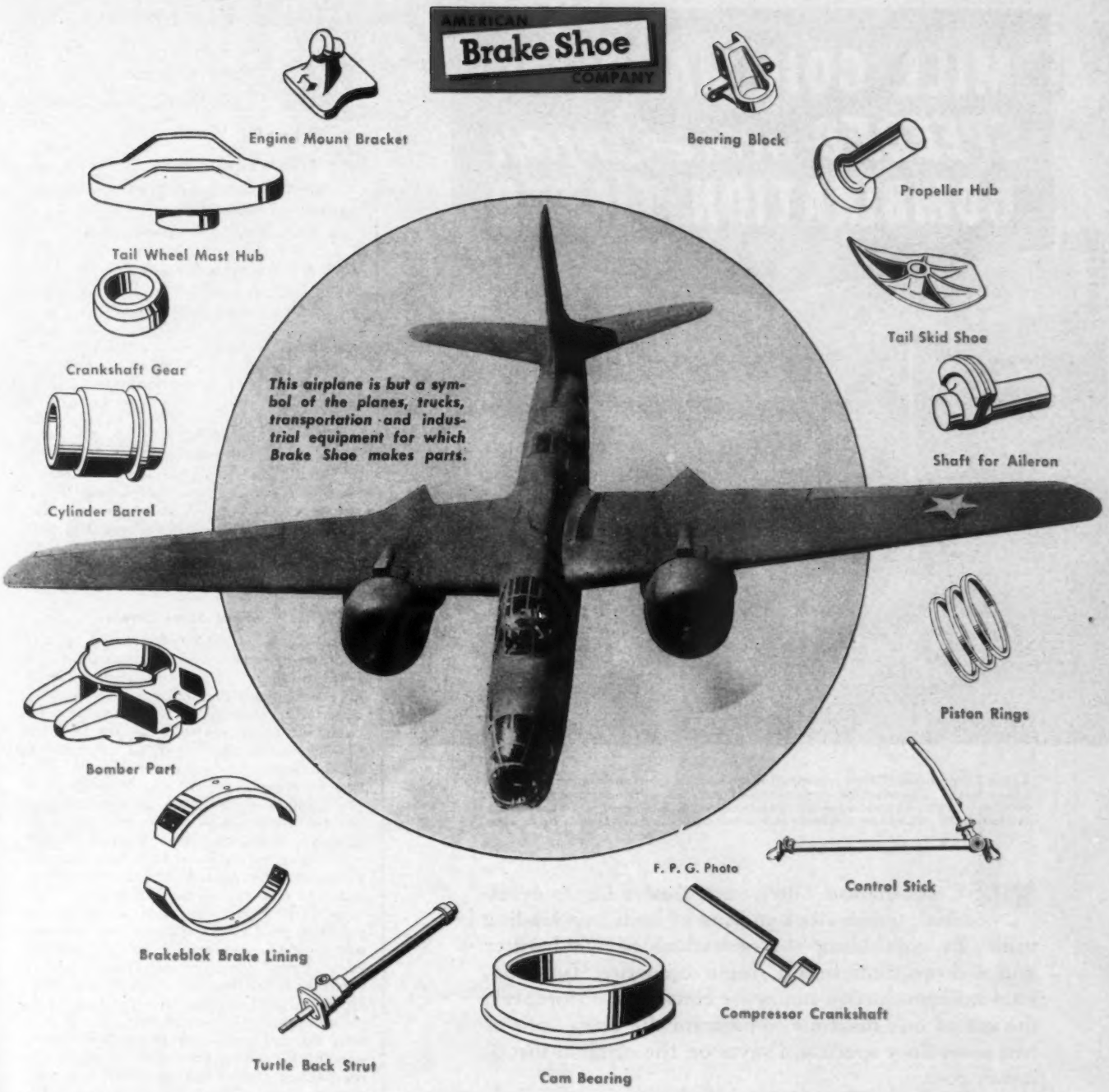
The revised program provides for:

Tugboats	
Complete construction	100
Towboats	
Complete construction	19
Cancelled	2
Steel Barges	
Complete as tank barges	100
Convert to hopper type	55
Cancelled	13
Wood and Composite Barges	
Complete as tank barges	159
Complete for reserve cushion convertible to any use	110
Cancelled, as announced September 9	36

Film on Thread Grinding Ready

Springfield, Vt.

• • • **"Thread Grinding**—Full Automatic" is the title of a 16-mm. sound film just completed by the Jones & Lamson Machine Co., Springfield, Vt. In 28 min. running time the film gives an instructive demonstration of the setting up and operation of a fully automatic thread grinder and is intended for the training of setup men and operators as well as others interested in the production of precision ground threads in either large or small lots. Animation has been used to portray some of the more intricate and unique functions of the machine. Prints are available for distribution among educational institutions and associations interested in the subject.



Consider these Questions about PARTS—

What would closer tolerances in the parts you buy mean in your machine shop costs?

How vital is *grain* in the forgings you buy?

Is first price more important to you than finished price, when you consider the cost of a part?

• • •

The reason we ask these questions is that our thinking starts at *your* end of the problem of buying parts for the products you make, or parts for maintenance.

We are not content merely to supply parts. Our Research and Engineering Departments are working right now with similar departments in many companies to improve materials and designs of the parts they are using.

The problems they are working on, have to do with such factors as alloying irons and steels for special applications; improvements of bearing metals; grain flow in forgings; increased precision of casting; the relations of stress analysis to design. And many others of like nature.

In some cases they affect the size of parts, and hence the amount of metal. In others, the question of sand or centrifugal castings versus forgings, or a different alloy.

Brake Shoe is constantly enlarging its research and engineering facilities. Right now an Experimental Foundry is nearing completion and a Development Machine Shop is projected.

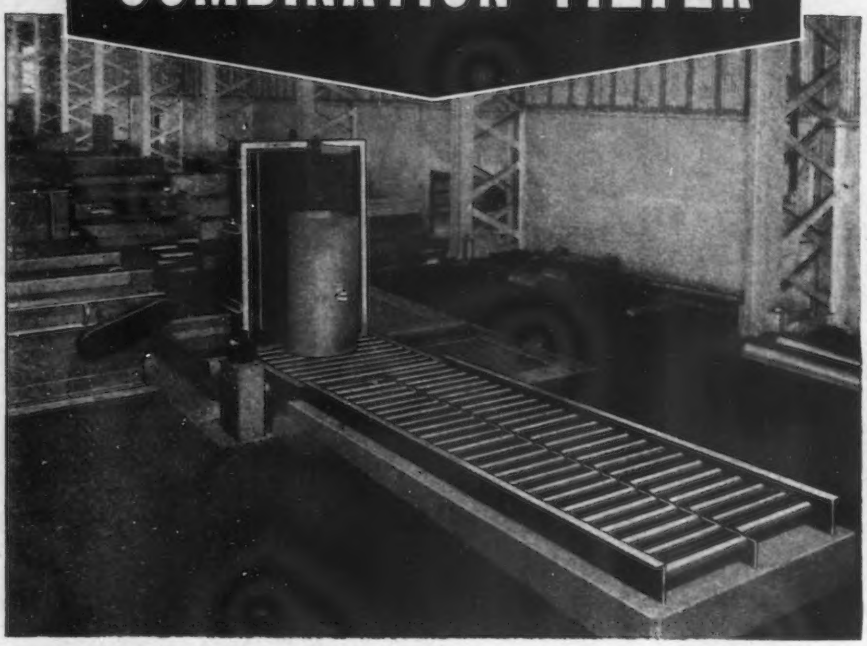
If you have a special parts problem, or if you are especially concerned with the questions discussed above, write to R. B. Parker, American Brake Shoe Company, 230 Park Avenue, New York 17, N. Y., and tell him what is on your mind.

58 PLANTS SERVING INDUSTRY AND TRANSPORTATION

American Brakeblok Division . . *Detroit, Mich.*
Ramapo Ajax Division . . . . . *New York City*
American Manganese Steel Division . . . . . *Chicago Heights, Ill.*
Brake Shoe & Castings Div. . . *New York City*
Kellogg Division . . . . . *Rochester, N. Y.*
American Forge Division . . . . . *Chicago, Ill.*
Southern Wheel Division . . . *New York City*
National Bearing Metals Corp. . . *St. Louis, Mo.*

ENLIST YOUR DOLLARS FOR VICTORY • BUY MORE WAR BONDS TODAY

MILL COIL HANDLING *SPEEDED* WITH *Logan* COMBINATION TILTER



Logan Combination Tilter (patented) receives coils from short storage line of Logan Rolls. The machine down-tilts and then side-tilts coils preparatory to moving to reel. Equipment at left is entry conveyor table used when sheets are fed into mill. This sheet conveyor is removed by crane when strip is being fed.

THIS Combination Tilter, an exclusive Logan development, speeds the handling of coils in a leading mill. By combining the operations of a side-tilter and a down-tilter into a single operating function, vital mill productive hours are conserved. Moreover, the use of one machine to perform the operations of two saves floor space and saves on the original installation cost.

Logan Conveyors are not only speeding up production, saving space and manpower in mills and foundries, but in thousands of other metal working plants as well. There are specialized Logan catalogs devoted to steel mill conveyors, to foundry conveyors and to metal working plants and industries in general. Write for the catalog which you would like, or contact your nearest Logan engineer. Logan Co., Incorporated, 545 Cabel St., Louisville 6, Kentucky.

Logan Conveyors

PUT *FLOW* INTO PRODUCTION

OPA Interprets Some Special Scrap Price Features

New York

• • • **The local offices of OPA have issued the following special interpretations of certain confusing issues in the pricing of specialized scrap.**

RPS 8—Stainless Steel Scrap

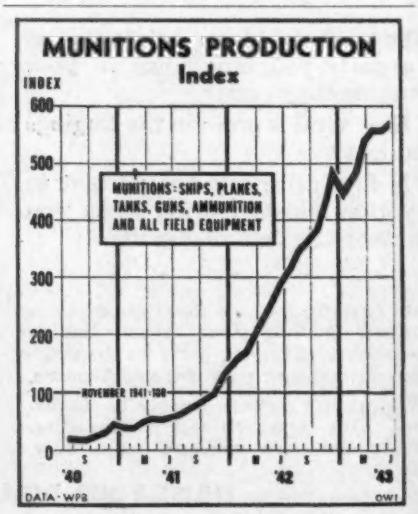
Straight-chrome type stainless steel borings and turnings usually contain at least 12 per cent chrome. The maximum price for material containing 12-14 per cent chrome is $30.00 per gross ton as provided in Revised Price Schedule 8.

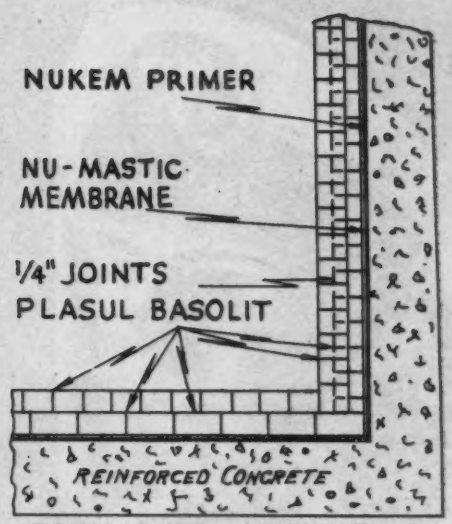
However, this type of scrap with a chrome content less than 12 per cent should be sold at prices fairly reflecting the lower chrome content. Sellers of Type 410 stainless steel turnings containing 11.75 per cent chrome have recently appealed to OPA for a ruling on a maximum price. OPA suggested, in this case, that the price be reduced by 53c. per gross ton. This penalty equals the value of 0.25 per cent chrome at 9½c. lb.

MPR 379—Tool Steel Scrap

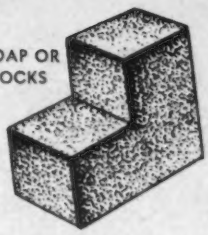
Questions are frequently raised by iron and steel scrap dealers regarding the dealer differentials and commissions which may be charged on tool steel scrap. Differentials ranging from 1c. to 2c. per pound of scrap material as set forth in the regulation may be added by a dealer to the maximum price for a particular type of scrap only when such scrap is in the form of solids. The differentials are not permitted on scrap in the form of millings and turnings. Moreover, tool steel scrap in the form of solids must be physically segregated by the dealer in order to qualify for the differentials.

If a consumer engages a dealer to purchase tool steel scrap for his account and to clean, segregate, test, or analyze such scrap, the consumer may pay a commission to the dealer for this service. However, on millings and turnings and on unsegregated solids, the commission plus the price paid to the seller cannot exceed the ceiling prices set forth in the regulation. On segregated solids, the commission plus the price paid to the seller cannot exceed the maximum prices for the particular type of scrap *plus* the dealer differentials provided in the regulation.

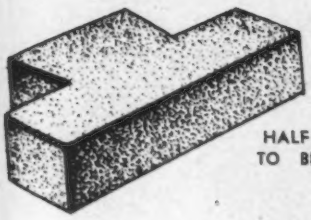




DETAILS OF MONOLITHIC WALL AS SHOWN IN FIG "A"



USED AS SOAP OR CORNER BLOCKS



HALF BRICK USED TO BREAK JOINTS

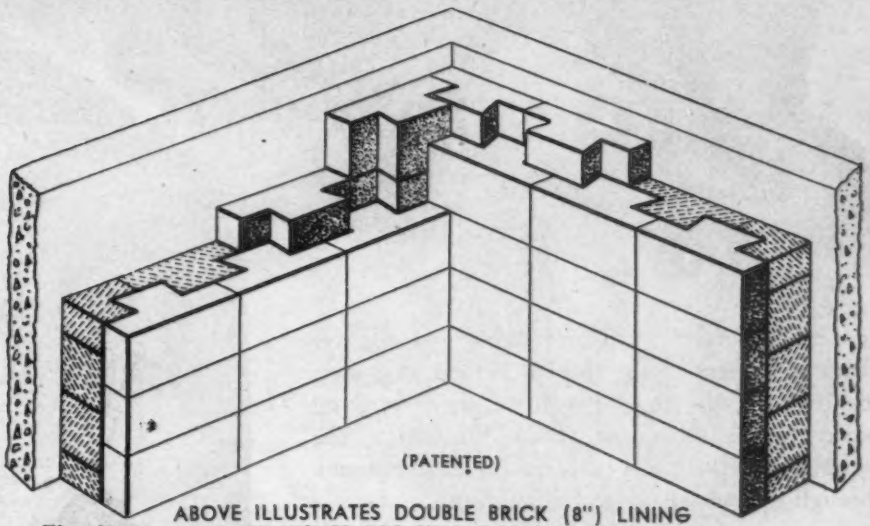
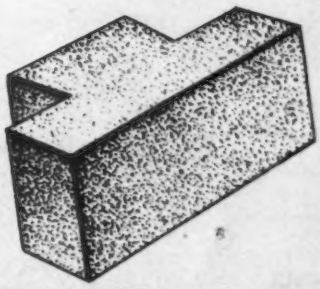


Fig. "A" ABOVE ILLUSTRATES DOUBLE BRICK (8") LINING ALSO FURNISHED FOR SINGLE BRICK (5") LINING



REGULAR STRETCHER USED IN WALL

Nukem Monolithic Construction is the most advanced development of acid tank construction in recent years.

The unique key brick shapes, when laid up as illustrated with all joints broken, staggered and cemented, provides a monolithic unit of unbelievable strength.

Nukem Monolithic refractory design marks a revolutionary step forward in the science of structural engineering.

Nukem Monolithic Construction requires less jointing compound and is most economical to install. All installations guaranteed—write for information.

Nukem Products Corp., Buffalo, N. Y.

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PACIFIC COAST REPRESENTATIVES — SOUTHWEST REPRESENTATIVES

KRAFTILE COMPANY
LOS ANGELES NILES SAN FRANCISCO
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ELGIN BUTLER BRICK CO.
AUSTIN DALLAS HOUSTON, TEX.

EVERY SUB COMMANDER
KNOWS THE IMPORTANCE OF

Centralized Control

Instant response — unfailing action in every mechanical element of the ship — is vital to protect the lives of the crew as well as giving striking power to the submarine. From his station, the commander skillfully directs its performance through centralized control equipment.

★ ★ ★

The centralized controls of Milwaukee Milling Machines give the operator complete command of his machine — enable him to control its performance to the fine degree he demands for the full expression of his skill.

Speed and feed dials — all control levers within easy reach — the latter duplicated front and rear on plain and universal horizontal machines (model 2K and larger) — contribute to the sustained precision of Milwaukees, in the tool room or on the production line.

KEARNEY & TRECKER
CORPORATION
MILWAUKEE, WISCONSIN

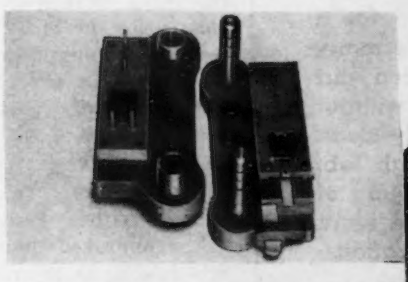
Buy Victory with at least 10% in War Bonds!

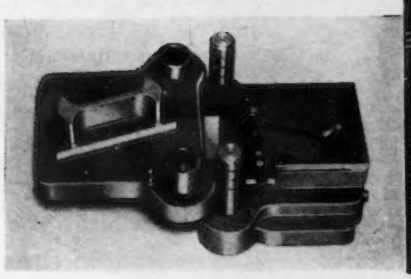
Milwaukee MACHINE TOOL

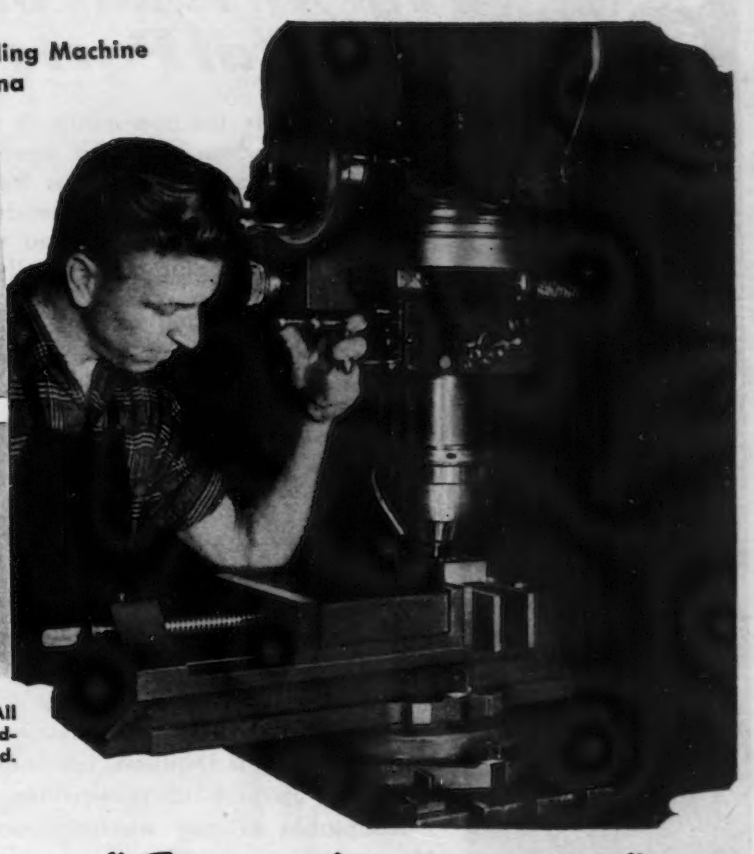
"One of the most Outstanding Machines I've ever seen"

JOHN W. RIX, *Mfg. Engineer*
Cessna Aircraft Co.

The Milwaukee Rotary Head Milling Machine "Under Fire" At Cessna







On tools like these no layout was required. All machining was done by working to "dial" graduations. Direct measurements were eliminated.

Proof That This Machine *"Has what it takes"*

Is Found In Mr. Rix's Statement:

"I consider the Milwaukee Rotary Head Milling Machine to be one of the most outstanding machines I've ever seen for tool room work. It paid for itself in the first few months of operation. We have repeatedly accomplished feats which I would not have believed possible if I had not seen them myself."

(signed) JOHN W. RIX

Since purchasing their first Milwaukee Rotary Head Milling Machine, Cessna Aircraft has milled hundreds of complicated blanking dies of geometrical form. Furthermore, they milled the punches to fit these dies with .001" clearance in between without resorting to hand fitting of any kind.

This meant that the punches and dies were heat-treated at the same time. Then, after surface grinding, they were ready for mounting on the die set.

The Milwaukee Rotary Head Milling Machine is without equal in the high speed, accurate, economical production of dies, molds, hobs, as well as the precision machining of many parts. In a single set-up, it performs layout, milling, drilling precision boring and slotting operations—mills circular and angular cuts in both vertical and horizontal planes.

The "Machine of Tomorrow" — here today!

As a leader in your field you should have the complete story on the Milwaukee Rotary Head Milling Machine and its remarkable, low-cost performance. Write for Bulletin 1002A.

Rotary Head Milling Machine
•
Autometric Jig Borers
•
Center Scope

Kearney & Trecker *Products*
CORPORATION
Milwaukee, Wisconsin
Subsidiary of Kearney & Trecker Corporation

Milwaukee Face Mill Grinder
•
Milwaukee Midgetmill
•
Milwaukee Speedmill

A New INTERMEDIATE CLEANER--

for All Kinds of Metal Parts!

Magnus 731—the new emulsion cleaner was developed to meet the need for a safe, speedy metal cleaner for the many cases where chips, loosely bonded dirt and lubricant must be removed without the need for providing a chemically clean surface. It does a quick, thorough job, leaving the work with a slight coating of oil for anti-rusting protection while work is being held for subsequent operations, or shipped to other plants.

Used Straight or in Water Emulsion

Magnus 731 is used straight as a pre-clean dip or spray before solvent degreasing, or in a 1-100 water emulsion. It works equally well as a spray or dip, and requires no rinsing. Where a heavier, anti-rusting oil film is required, emulsion may be made up to 4-100 proportions.

Adaptable to any washing machine, Magnus 731 is neutral, non-odorous, non-toxic, non-volatile and non-inflammable. It can be used on any metal with complete safety . . . at any temperature from room to boiling.

HAVE YOU ASKED FOR YOUR COPY OF THE MAGNUS METAL CLEANING HANDBOOK? IF NOT, WRITE NOW! YOU CAN MAKE PRACTICAL USE OF THIS COMPLETE MANUAL ON MATERIALS, METHODS AND MACHINES FOR METAL FINISHING OPERATIONS.

MAGNUS CHEMICAL COMPANY
46 South Avenue
Garwood, N. J.

☐ Send full information on Magnus 731.
☐ Send the "Metal Cleaning Handbook".

Name ..... Title .....

Company .....

Street .....

City ..... State .....

Magnus CLEANERS-METHODS-MACHINES

NEWS OF INDUSTRY

Secondary Aluminum Alloys Sales Clarified

Washington

• • • **Sales of secondary** aluminum alloy as reported on WPB Form 554 (formerly PD-272) indicate some misinterpretation in connection with the provision which requires the prices of "hardeners" to be submitted to OPA's Washington Office for approval. To clarify this point, the sale of every hardener, whether or not it has been sold above the maximum base price of 14.00c. a lb., must be reported within five days in accordance with the procedure required by the regulation. This, of course, does not apply to sales made at prices which have been previously approved unless such approval had been subsequently withdrawn. However, those prices approved under Revised Price Schedule 2, as amended, must be reduced by 1c. a lb. in order to bring them into line with the prices under Maximum Price Regulation 2. If the resultant price is inconsistent with those established by MPR 2, it may then be resubmitted for approval.

•

Critical Situation Expected on Drums

Washington

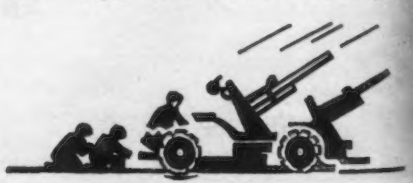
• • • **A critical situation** will develop in steel shipping drums in the fourth quarter of 1943, WPB Containers Division stated on Tuesday. This is due mainly to a suddenly increased demand from several Claimant Agencies. The increase has resulted in a condition whereby a considerable tonnage of steel allotted under CMP for making steel drums for the fourth quarter cannot be scheduled in steel mills because their schedules are already filled.

•

Seamless Order Extended

Washington

• • • **WPB recently** said that the use of seamless steel tubing under Order L-126 has been extended from Sept. 15 to Jan. 1. The amended order limits the use of tubing in the production of finned coil or tube assemblies where the tubing is expanded to obtain the bond between tubing and tins, and fins, or where the tubing is ⅝ in O.D. size or larger.



ADVANTAGES OF THE SHEFFIELD THREAD ROLL-SNAP GAGE

Manufactured Under Patents Nos. 1,660,335; 1,851,283; 1,930,558

This single gage takes the place of two ring gages—GO and NOT GO.

It checks maximum and minimum pitch diameter, major diameter, lead, thread form, roundness, and straightness.

There is no tendency to bind or cramp.

Screw threads may be checked before the work part is removed from the thread cutting machine.

Chips and dirt do not cling to the thread rolls of the gage to jeopardize gage accuracy.

There is little friction, and therefore practically no wear, between the gage and work part because the thread rolls rotate. No other type of thread gage has as long a service life.

Gage is adjustable.

Replacement parts always available. Rolls may be reground when worn.

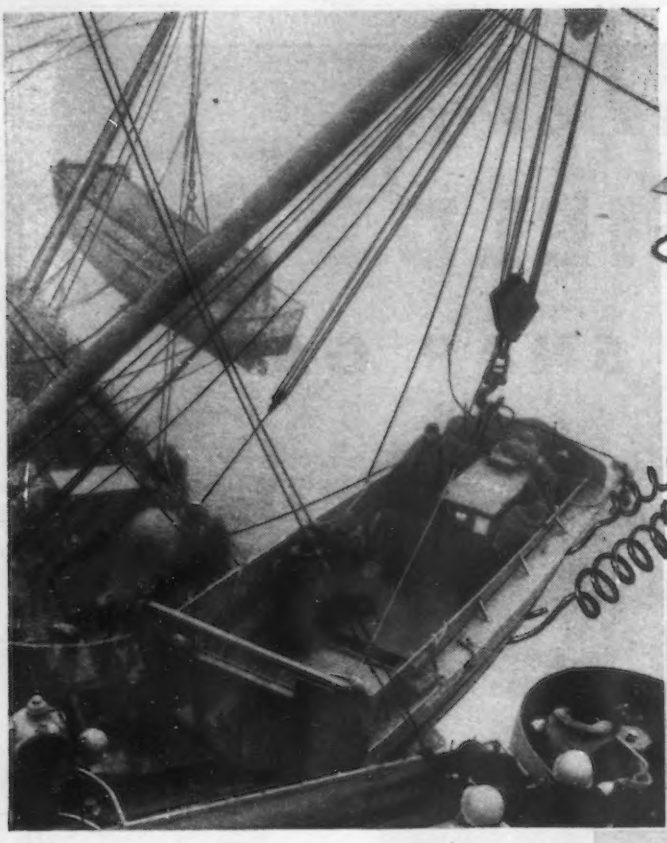
Thread ROLL-SNAP Gage Stand leaves both operator's hands free for rapid inspection.

WRITE for descriptive Bulletin G662-143.

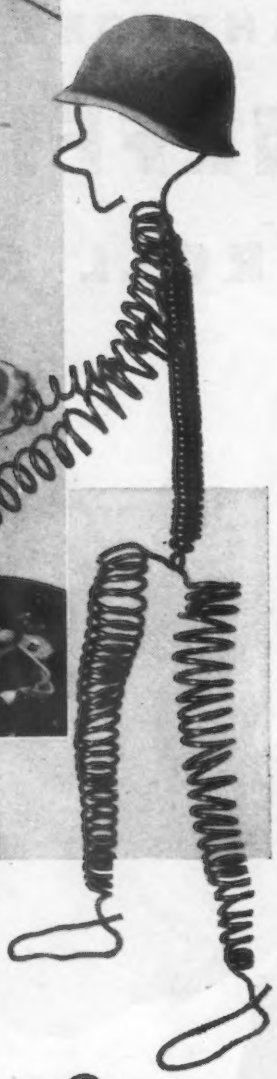
THE SHEFFIELD CORPORATION

Dayton 1, Ohio, U.S.A.

SHEFFIELD MASTER CRAFTSMEN



Press Association Photo



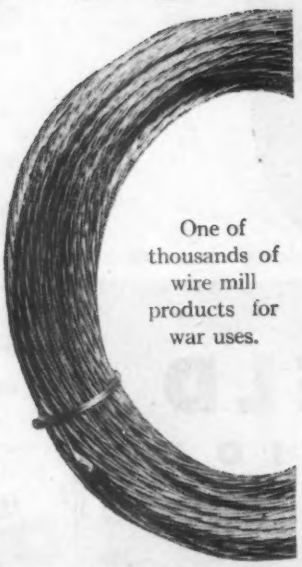
Lending a Hand for Invasion . . . ..KEYSTONE wire

This scene—launching landing barges for the attack on Attu—is now being re-enacted time after time at many invasion hot spots. And every time it occurs, wire is privileged to play a highly essential role. Notice the hundreds of feet of husky cable required for each boom that swings a barge over the side of the transport.

This is but one of thousands of ways in which wire mill production helps add impetus to the invasion. Planes, bombs, ships, tanks and ammunition, too, call on Keystone for many vital parts.

Victory comes first . . . after that we hope to again lend an efficient hand on many CIVILIAN assembly lines.

KEYSTONE STEEL & WIRE CO.
PEORIA, ILLINOIS



One of thousands of wire mill products for war uses.

Special Analysis Wire for All Industrial Uses

SAMSON SPRING WIRE
KEYSTONE STEEL & WIRE CO. PEORIA, ILL.

Just a little SCRAP counts up for finishing the big scrap!

Warehouse Volume Down 11.2% in 1942

Cleveland

• • • **Steel warehouses suffered** a drop in total volume of business of 11.2 per cent in 1942 as compared with 1940 according to a new summary released by Walter S. Doxsey, president of the American Steel Warehouse Association here.

In 1942, warehouses and jobbers received 5,937,609 net tons from producers. In 1940 they accounted for 6,686,534 tons of finished steel mill products. The decrease was 748,952 tons—11.2 per cent. Total mill production, however, scored an increase of 31.3 per cent. A record high point was enjoyed by warehouse distributors in 1940 when receipts were 29 per cent above 1939, the previous top year. Prior to 1939, 1929 held the record with 4,468,937 tons.

The sharp influence of the war was especially evident in the curtailment of some merchant product deliveries to distributors. Galvanized sheets were down 61.4 per cent; wire products 10.5 per cent; pipe and tubes, 23.7 per cent. The decline for all merchant products was 28.5 per cent.

The general steel products available for warehouses also fell far short of 1942 demand. The breakdown of the priority system was a key factor in depriving distributors of badly needed replenishments. Receipts of the general steel items dropped 21.8 per cent below the tonnages delivered by producers during 1940. The critical situation which general steel warehouses experienced in 1942 is revealed by the fact that while production of these products jumped 36.2 per cent in 1942 over 1940, shipments to warehouses fell off 21.8 per cent.

Records Show Steady Decline Of Structural Steel Bookings

• • • **The bookings** of fabricated structural steel (buildings, bridges and sundry war product items) for the month of August amounted to 43,951 tons, as compared with 80,605 tons for the corresponding month last year, according to reports received by the American Institute of Steel Construction, Inc.

Shipments showed a further decline to 51,511 tons from 61,922 tons for the previous month. The tonnage available for future fabrication at Aug. 31 was 281,537 tons.

Put FLUOR MAINTENANCE AND REPAIR *Service on Your Schedule* NOW *While Materials and Labor are Still Available*

YOUR OPERATING RECORDS will show you what your water cooling requirements have been *this past summer. You can estimate now* what they will be *next summer.* To be sure that your tower, regardless of make or type*, can meet these anticipated demands you should have Fluor check these seven vital *maintenance* and *repair* needs now: (1) Condition of decks or filling (2) Condition of flumes or distributing system (3) Analysis of water loading (over-loading or under-loading) (4) Analysis of net effect of re-cycling (5) Condition of stair treads, ladder rungs and hand rails (6) General condition of structure (7) Condition of mechanical equipment (motors, fans, gears, flexible couplings, etc.).

Deficiencies at any one or all of these points will be corrected by Fluor *maintenance* and *repair* service. The result is increased operating and thermal efficiencies and longer life for your cooling tower.

The coming winter months lessen the demands on your cooling tower. So put Fluor *maintenance* and *repair* service on your schedule now, while materials and labor are still available. Call, write or wire your nearest Fluor office today for immediate action.

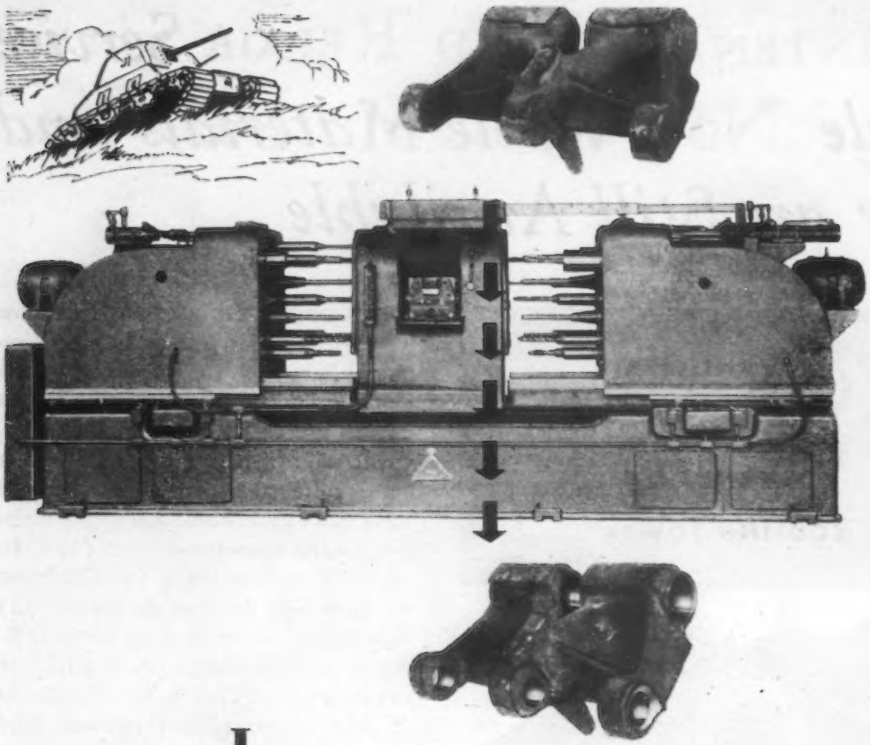
SINCE 1890

* Fluor *maintenance* and *repair* service covers *all makes and types of cooling towers.* Fluor also manufactures Atmospheric and Mechanical Draft Type Cooling Towers for the cooling of process water—in any quantity, in all services.

FLUOR

COOLING TOWER DIVISION OF THE FLUOR CORPORATION LTD.

2500 So. Atlantic Boulevard, Los Angeles 22, Calif. · New York · Pittsburgh · · Kansas City · Houston



LARGE hole (1.656″) of track link for popular tanks reamed from both sides (.005 tolerance)—small hole (1.125″) line—reamed entire length from one side (plus, minus .001)—on this 20-foot double-end horizontal, multi-drilling and reaming machine engineered and built by LeMaire. Reaming operations are timed to be completed in same time required for drilling holes. Outside holes are chamfered an extra depth to have required chamfer remaining after broaching. Center trunnion has five operating stations and one loading station and is operated manually. It can also be made for automatic operation.

This is one of the many machines that have been engineered and built by LeMaire to meet increased production demands. In many cases, we have combined in one machine operations formerly performed on several independent ones—resulting in giving users a stepped-up production of three, four, and often ten times the output they were able to get before.

If you have problems that involve production capacities, let us discuss them with you.

BUY WAR BONDS

LeMaire TOOL AND MFG. CO.
2661 TELEGRAPH ROAD DEARBORN, MICHIGAN
ENGINEERS AND BUILDERS OF PRODUCTION MACHINES

Fifth Year Brings Canadian Output Peak

Ottawa

• • • **As Canada entered** the fifth year of war her war production reached a peak of $55,000,000 worth of munitions a week, C. D. Howe, Minister of Munitions and Supply, stated. Reviewing Canada's war production program, Mr. Howe presented new figures placing at $3,004,000,000 expenditures for the year ending Sept. 1 last, on war production and construction by the Department of Munitions and Supply. Persons directly or indirectly employed in war work at that date were estimated at 1,100,000 and summaries of the production of specific war materials showed new highs. Mr. Howe said:

"In the four years since September, 1939, more than $800,000,000 has been spent on new plants and machines.

"By the end of this year Canada will have launched approximately 750 ships and delivered more than 10,000 aircraft," Mr. Howe said. "Military vehicle production will have passed the 600,000 mark and armored fighting vehicles output the 35,000 level. The country will have turned out nearly 100,000 guns, barrels and mountings, as well as 1,000,000 small arms. It will have manufactured more than 1,000,000 tons of explosives and war chemicals; some 60,000,000 complete rounds of heavy ammunition and well in excess of 3,000,000,000 rounds of small arms ammunitions.

The total dollar value of the instruments and communications material output will be nearing $300,000,000. With the launching of the 200th Canadian 10,000-ton cargo ship last

SOMEONE WILL HAVE A RUDE AWAKENING

OHIO
Ferro-Alloys

FERRO-SILICON

50%—75%—85%—90%

HIGH CARBON FERRO-CHROME

HIGH CARBON FERRO-MANGANESE

BOROSIL . . . SIMANAL

BASIC FOR THE EMERGENCY STEELS NOW

ESSENTIAL FOR THE NEW STEELS OF 194x

Ohio Ferro-Alloys Corporation
Canton, Ohio
Chicago Detroit Pittsburgh Tacoma

DEPENDABILITY PHILO BRAND QUALITY · SERVICE
DEPENDABILITY RAINIER BRAND QUALITY · SERVICE

5 AMPCO METAL Applications in *The Army Sikorsky* Helicopter

. . . to assure safe, reliable performance

In advanced engineering development — such as this new sensational aircraft design — Ampco Metal receives generous recognition, indicating the basic importance of this alloy of the aluminum bronze class. Modern design calls for modern alloys — and Ampco bronzes have earned the regard of design engineers in the aviation field because of exceptional performance.

Throughout all industry, parts of Ampco Metal are doing valiant service. In aircraft, ordnance, machine tools, marine service, Ampco Metal meets gruelling service conditions — proves its high strength, hardness, long-wearing characteristics, and general all-around versatility.

Investigate Ampco Metal for use in your equipment — and enjoy the satisfaction and prestige that comes through the "discovery" of a bronze that really solves your metal problems. Ask for free bulletin, "File 41 — Engineering Data Sheets."

AMPCO METAL, INC.

DEPARTMENT 1A-10 MILWAUKEE 4, WISCONSIN

AMPCO METAL

AMPCO

THE METAL WITHOUT AN EQUAL

month, Canadian shipyards had to their credit the building within two years of a fleet of freighters equal to 10 per cent of the total merchant tonnage of Great Britain at the beginning of the war.

More than 600 ships have been sent down Canadian ways since the outbreak of war—merchant vessels, frigates, corvettes, minesweepers and patrol-vessels. Over-all commitments for shipbuilding in Canada total $1,000,000,000, of which about one half is earmarked for cargo vessel construction; more than $15,000,000 for small boats; $15,000,000 for ship repair and overhaul and the balance for escort and fighting ships.

"Under the aircraft production program more than 9000 planes have been delivered. Employed in the Canadian aircraft industry and component factories there are now 100,000 workers more than a quarter of them women, who are building nine types of aircraft, four trainers, four service planes and one transport. In addition there has been created a giant overhaul industry to repair the thousands of planes now in use in Canada.

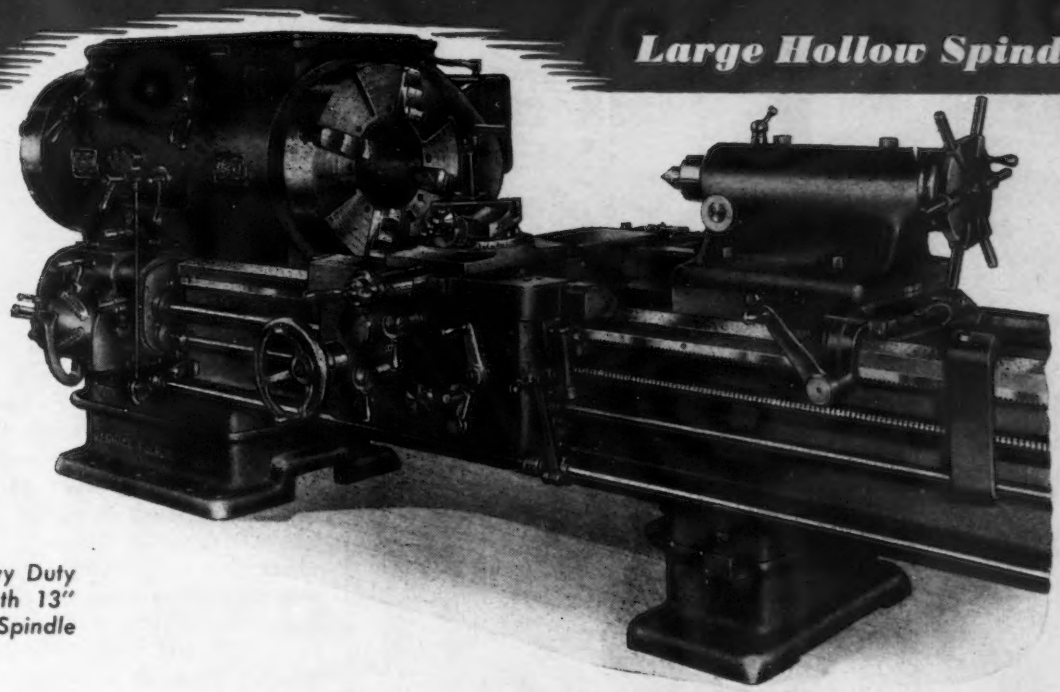
Canada has an important role in the production of universal carriers, scout cars, armored cars, reconnaissance cars, as well as tanks and self-propelled artillery. Of the two types of tanks produced in Canada one, the Valentine, now has been discontinued, but more than 1400 units, the entire production has been shipped to Rus-

WITH A HUGE "V" of scrap metals spread before her, Queen Betty Kuether, production worker at Allis-Chalmers Mfg. Co., reigned over the salvage parade held in Milwaukee by the WPB at the opening to the Fall scrap drive.

HYDRATROL LATHES

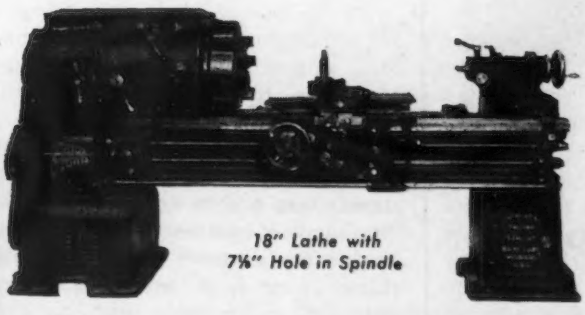
Wide Range of Sizes Provide Efficient Application to a Wide Range of Work!

Large Hollow Spindle Type



30" Heavy Duty Lathe with 13" Hole in Spindle

Complete Line of Sizes from 18" to 36" . . .



18" Lathe with 7¼" Hole in Spindle

SMALL—18" . . . . . Up to 7¼" Hole

MEDIUM—24" . . . . Up to 12" Hole

LARGE—27" . . . . . Up to 13" Hole

LARGE—30" . . . . . Up to 14" Hole

LARGE—36" . . . . . Up to 16½" Hole

8 Distinctive Features

- Easy, Fast, Simple Operation.
- Hydraulic Brakes and Clutches.
- Absence of Mechanical Troubles.
- Essential Operating Information Automatically Presented (on all Standard Models).
- Automatic and Ample Lubrication.
- Mechanism Protected by Automatic Control.
- Extraordinary Hardness of Bed.
- Available with Large Turrets for carriage which fully utilize the Great Power Capacity of these machines; and with Beds on both ends of Headstock.

Lehmann MACHINE COMPANY

CHOUTEAU AT GRAND ★ SAINT LOUIS (3) MISSOURI

RUTHMAN

Gusher Coolant Pumps

THE OUTSTANDING COOLANT PUMP TODAY

FLANGE MOUNTED TYPES

PIPE CONNECTED TYPES • IMMERSED TYPES

Cutting tools are made of strategic metals. Avoid wasting these metals and improve your production at the same time by using the proper cutting oils delivered in ample volume by the proper coolant pumps.

The proper coolant pump these days is the Ruthman Gusher Coolant Pump — preferred by so many machine tool builders and users. It was perfected to a high degree long before the war, and it admirably serves the needs of war production — being more free from troubles involving maintenance.

The RUTHMAN MACHINERY COMPANY
CINCINNATI, OHIO

sia. The Ram M-3 tank also has been abandoned in favor of the M-4 tank, a type standard for the United States, British and Canadian armies.

"Canada's largest ordnance manufacturers, the John Inglis Co. Ltd., Toronto, has delivered more than 100,000 Bren guns and is preparing to go into production on a 9 mm. Browning pistol as well as barrels for a .303-inch Vickers machine gun and 20 mm. anti-aircraft cannons. The Inglis plant also has delivered 50,000 anti-tank rifles and 33,000 aircraft machine guns.

"Small Arms Ltd., a government owned plant in the Toronto area, is turning out 35,000 army rifles per month and this is being stepped up to 40,000. Sten guns are being produced in the same plant at the rate of 6000 a month.

"Other types being made in Canadian arsenals are Vickers .5-in. machine guns; two-inch bomb throwers; two- and three-inch trench mortars and .22 training rifles. Land guns that are the product of Canadian workers include the 25-pounder artillery field piece. Bofors and 3.7-in. anti-aircraft guns and six-pounder tank and anti-tank guns. Canadian plants also are making another type or army gun carriage; two other types of barrels and are tooling up to produce a 20 mm. army universal gun mount. Canadian plants are turning out a wide range of naval gun mountings and are manufacturing two-pounder pom-poms and two types of four-inch naval guns.

"In the field of ammunition Canadian manufactures range from 9 mm. Sten ammunition weighing a couple of ounces, to heavy howitzer shells weighing more than 300 lb. Every week factories are delivering more than 500,000 complete rounds of heavy ammunition and in excess of 25,000,000 rounds of small arms ammunition. Production includes bombs, depth charges, anti-tank mines, grenades and shell components such as cartridge cases, primers, and fuses. Scores of components for naval torpedoes also are made in Canada.

NICKEL AIDS THE RAILWAY INDUSTRY

to KEEP 'EM ROLLING!

Railroad men perform near-miracles every day. With less locomotive capacity and fewer freight cars than a decade ago, last year they moved about two-thirds more ton-miles of freight and over 100% more passenger-miles than in 1940. Figures for this year show substantial increases.

Now, with locomotive-miles per month boosted about 40% above the pre-Pearl Harbor figure, railroaders rely upon the enhanced mechanical properties Nickel adds to iron, steel and non-ferrous alloys.

Fortunately, engineering and operating departments have long known that, properly used, a little Nickel goes a long way to prevent fatigue failures and lengthen service life. It has been widely specified, to A.A.R. standards, for steam and Diesel locomotives, passenger equipment and freight cars that eliminate deadweight tons. Materials strengthened and toughened by Nickel are now staying on the job . . . despite overloads and stepped-up schedules.

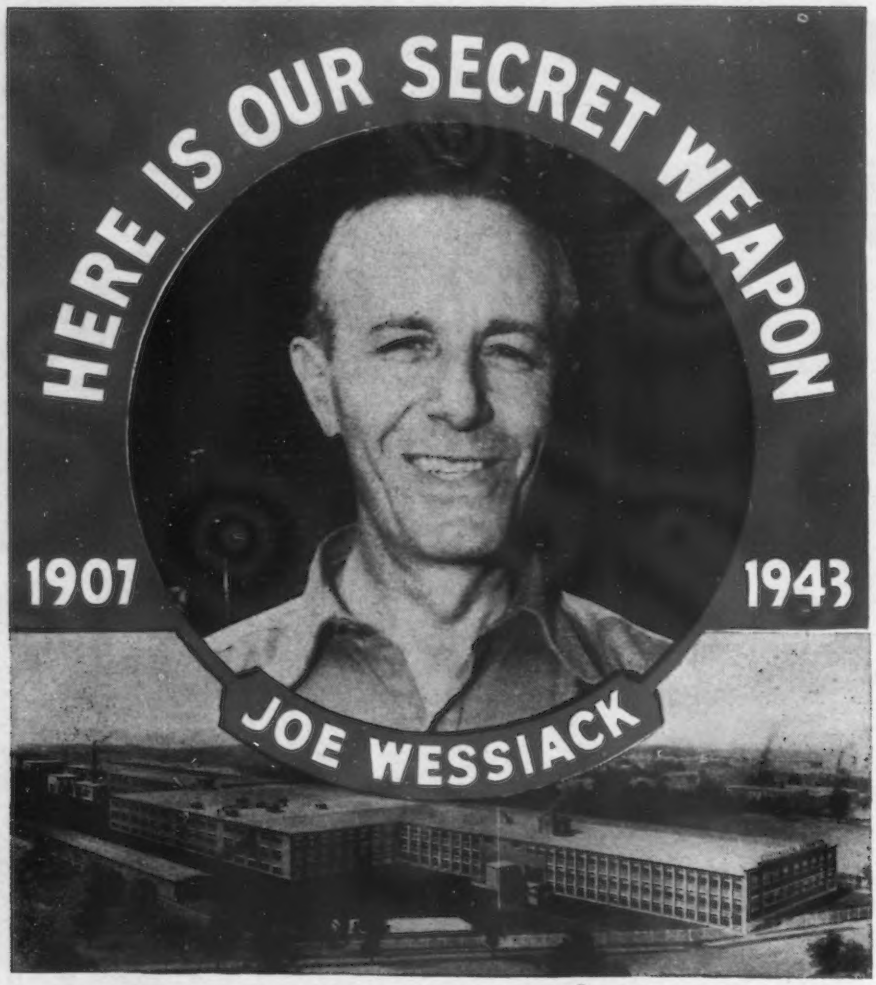
During years of peace it has been the privilege of International Nickel technical staffs to cooperate with the men who build and operate all types of railway equipment. Now, with a war to win and Nickel alloys diverted to more direct war uses, technical information and "know-how" become especially useful. Counsel, and printed data about the selection, fabrication and heat treatment of alloyed materials is available to you upon request.

New Catalog Index

New Catalog C makes it easy for you to get Nickel literature. It gives you capsule synopses of booklets and bulletins on a wide variety of subjects—from industrial applications to metallurgical data and working instructions. Why not send for your copy of Catalog C today?

★ *Nickel* ★

THE INTERNATIONAL NICKEL COMPANY, INC., *67 Wall St., New York 5, N. Y.*



THIRTY-SIX YEARS' SERVICE
Without A Day's Absence!

One of the most decisive battles of this global war is being waged here in America — the fight against absenteeism of essential war workers.

Through two wars, epidemics, catastrophes, panic, depression, hurricane and devastating New England storms, Joe Wessiack has NEVER BEEN LATE OR ABSENT FROM WORK during his *THIRTY-SIX YEARS* of faithful service at the Continental Screw Company. There could be no greater challenge to absenteeism than this remarkable record! Rumors of war-ending secret weapons come and go. But, with Joe Wessiack's unfailing spirit of loyalty, responsibility and punctuality exemplified by every war worker in America there would be no need of secret weapons to shorten the road to victory . . . no fighter's life would be needlessly sacrificed because he received too little — too late!

● Every HOLTITE product goes to war! Our 'round-the-clock production provides weapons for our 'round-the-world armed forces.

We are 100% subscribed to more than 10% payroll deduction for War Bonds. On to Victory with the 3rd War Loan!

THE LIVES OF OUR FIGHTING MEN HANG BY A THREAD

* We are determined that any screw thread made at Continental will be the best that skill and science, experience and exceeding care can produce.

CONTINENTAL SCREW CO. New Bedford, Mass., U.S.A.
BUY MORE WAR BONDS

Reusable Pipe Gets "In-Ground" Price Ceiling

• • • **Used iron and steel pipe** in the ground, when sold to a consumer or exporter, may be sold for the ceiling price for "reusable" pipe less the cost of lifting and reconditioning the pipe and loading it on railroad cars or trucks, the OPA announced last week.

If the seller is unwilling or unable to establish the cost of lifting, reconditioning, and loading, then the price must not exceed the maximum price for "used structural pipe."

Ceiling prices for both "reusable" pipe and "used structural pipe," OPA said, are established in Revised Maximum Price Regulation No. 230 which became effective in its revised form on Feb. 9 of this year. This regulation, it was pointed out, fixes maximum prices only on sales to consumers and exporters.

OPA Announces Hinge Advisory Group

Washington

• • • **Five executives** of firms engaged in the manufacture of hinges and butt hinges were named by OPA to serve on its Butts and Hinges Industry Advisory Committee.

Named to the committee are the following:

Howard N. Campbell, Jr., vice-president in charge of sales, McKinney Mfg. Co., Pittsburgh; Rodney W. Chamberlain, assistant general sales manager, Stanley Works, New Britain, Conn.; Archer L. Hager, vice-president, C. Hager and Sons Hinge Mfg. Co., St. Louis; Harry C. Pearce, secretary, Sharon Hardware Mfg. Co., Sharon, Pa.; Hugo M. Weyrauch, vice-president, National Mfg. Co., Sterling, Ill.

"I KNEW HE WOULDN'T COME ... HE NEVER TAKES A DAY OFF!"

WHEN THE PROBLEM CALLS FOR SPECIAL EQUIPMENT

Yanks Would Give Thanks for This!

MEDART has made it...or Medart can make it!

SOME OF THE SPECIAL MACHINES BY MEDART DURING THE PAST YEAR

★ An automatic machine for straightening rifle barrels.
★ A mechanism for driving a portable 1000 H. P. Generator with ten 100 H. P. diesel engines.
★ A machine for de-rodding metal tubing.
★ A billet cold centering machine for tube mills.
★ A 400 H. P. Gear reduction unit for a stern wheel towboat.
★ Mechanical driving units for agitator tanks.
★ Automatic bar feeding table.
★ Automatic bar delivery and storage tables.
★ Bar cradles.
★ Chain wheels.
★ Furnace car bearings.
★ Furnace door frames, etc.

Much as Medart engineers would like to ease the K. P.'s lot with the ingenious machine above, Medart concentrates, today, on the problems of American industry...the engineering and manufacturing of complete power transmission equipment and on the manufacture of special equipment for specialized jobs.

Over 1,000,000 pattern combinations are in Medart files. The solution to your own special equipment problem is very likely right on hand!... And that special machine you need may be made quicker than you think.

Manufacturing Engineers of Complete Transmission Equipment and Specialized Machinery

MEDART

THE MEDART COMPANY
3500 DE KALB ST., ST. LOUIS, MO.

You Obtain Better Anodizing Results

ON ALUMINUM

By Using Dependable

OAKITE DEGREASING

Materials . . . Methods

Before you anodize parts made of aluminum and aluminum alloys, be sure that surfaces are in CHEMICALLY CLEAN condition . . . completely freed of all oil, grease or other foreign matter that may impair the uniformity of the anodized coating or film.

Many aircraft plants will tell you that you can meet this essential requirement easily, safely, economically by using Oakite Aviation Cleaner. Here is a specialized, free-rinsing material that thoroughly, speedily removes deposits . . . and does it without pitting, etching or discoloring aluminum surfaces.

40-Page Manual *FREE!*

New, 40-page manual gives further data on performance-proved, time-saving Oakite methods for cleaning aluminum before anodizing, spot-welding, painting, heat treatment and other essential production operations. Write for your FREE copy TODAY!

OAKITE PRODUCTS, INC.

30H Thames St., New York 6, N. Y.

Technical Service Representatives Located in All Principal Cities of the United States and Canada

OAKITE *Specialized cleaning*

Buy Bonds for Victory

MATERIALS & METHODS FOR EVERY CLEANING REQUIREMENT

Briefly Told—

Research Lessens Danger Of Fire in War Plants; Gov't. Needs Draftsmen

• To safeguard the lives of hundreds of thousands of industrial workers and minimize the dangers of fires and explosions in war plants, the Bureau of Mines has ascertained the inflammable characteristics of many of the powdered metals used or produced in factories turning out weapons and other equipment for the nation's fighting forces, according to Harold L. Ickes.

•

• Over a hundred draftsmen are being sought by the U. S. Civil Service Commission for work in federal agencies. Entrance salaries range from $1752 to $3163 a year. Draftsmen of all types are needed, particularly ship, electrical, and mechanical. Qualified engineering draftsmen in any field are urged to apply.

•

• *Brazilian-built trainer planes will be powered with Brazilian-built airplane engines, under a contract recently signed between the Brazilian government and officials of the Fairchild Engine and Airplane Co. Under the agreement, the new engine factory will begin production under Fairchild license on a 6-cylinder Ranger model, inverted, in-line air-cooled motor. Drawings, manufacturing data, jigs, tools and fixtures will be provided by the Fairchild Company.*

•

• Rocket-propelled projectiles manufactured by Philco Corp., Philadelphia, for the bazooka, hitherto secret weapon of the United States Army, have been flown to North Africa and put into action within a few days after leaving the factory, it has been disclosed.

•

• Consolidated net sales by The Aviation Corp. of aircraft engines, propellers, precision parts and other war materials for the nine months ended Aug. 31, totaled $57,234,555, almost doubling the $29,635,211 volume for the corresponding period last year. Net income before federal taxes amounted to $9,727,486, compared with $8,371,716.

•

• Membership in the Gray Iron Founders' Society has grown to an all-time high of 700, according to W. W. Rose, executive vice-president. The association now has members in 42 states and Hawaii. Over the past year its membership has shown an increase of nearly 25 per cent.

•

• A new Bureau of Mines educational motion picture entitled "Stainless Steel," telling the production story of a corrosion-resistant metal that combats costly rust, has just been released for free public distribution. Applications for free short-term loans of "Stainless Steel" should be addressed to the Graphic Services Section, Bureau of Mines, 4800 Forbes Street, Pittsburgh 13, and should state specifically that the borrower has a sound projector for 16-mm. film.

•

• *The daily production of Jeep bodies by American Central Mfg. Corp., Connersville, Ind., has been doubled in recent weeks as a result of a contract to build these units for the Ford Motor Co., according to the president of American Central.*

•

• A release from the Foundry Equipment Manufacturers Association states that the order index for the month of August totaled 390.4, compared with 379.4 for the month of July.

•

• Full production of "Lucite" methyl methacrylate resin, used for bomber noses

WOMANPOWER

16 MILLION *WOMEN (18 TO 64) ARE WORKING IN THE U.S.*
(38% OF TOTAL FEMALE POPULATION OF THESE AGES)

7 MILLION *WOMEN (18 TO 64) ARE WORKING IN BRITAIN*
(46% OF TOTAL FEMALE POPULATION OF THESE AGES)

3 MILLION MORE *U.S. WOMEN WORKERS WOULD BE NEEDED TO EQUAL BRITAIN'S PERCENTAGE*

V-712

MEDIA DIVISION OWI

COURTESY THE JOHN BERTRAM & SONS COMPANY, LIMITED, DUNDAS, CANADA

Accurate RAPID INSPECTION OF TOOLS AND GAGES

Jones & Lamson Optical Comparators assure accurate, rapid inspection of tools and gages in the Pratt & Whitney Plant of John Bertram & Sons Co., Dundas, Canada.

The use of these **Comparators** by progressive manufacturers everywhere, has resulted in better tools and gages, increased efficiency in inspection departments and substantial savings in materials and costs.

Various models are available to cover an almost unlimited range of inspection work, and our inspection engineers are ready to study your problems and make recommendations based upon more than twenty years' experience in the field of inspection by optical projection.

Universal Turret Lathes . Fay Automatic Lathes . Automatic Thread Grinders . Optical Comparators . Automatic Opening Threading Dies

JONES & LAMSON MACHINE CO., SPRINGFIELD, VERMONT, U.S.A.

Profit-producing Machine Tools

7 SERVICES

SEVEN AGERSTRAND SERVICES SPEED SCHEDULES

● Faced with the greatest production demands in history, important war contractors are relying upon the Agerstrand Corporation to help them solve difficult engineering and manufacturing problems . . Always in harmony with the most advanced technical practices, we offer our complete facilities for your present and postwar planning.

1 Engineering Service

● Our staff of tool and machine engineers are at your service to solve production problems.

2 Metallurgical LABORATORIES

3 Electro-plating

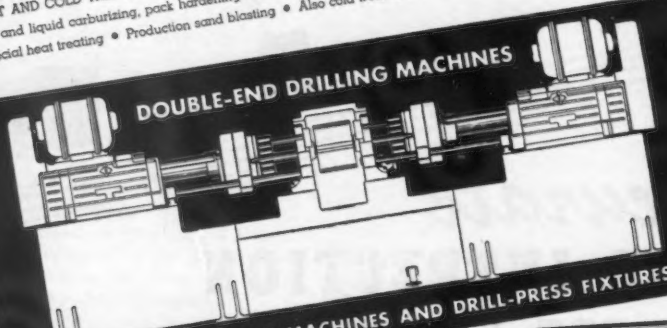
CADMIUM • ZINC • TIN • COPPER • CHROME

4 Heat Treating AND COLD TREATING

HEAT AND COLD TREATING: Bellis Liquid Triple Furnaces for hardening and drawing high-speed steels Gas and liquid carburizing, pack hardening • Nitriding • Cyaniding, liquid, and high-speed case hardening Special heat treating • Production sand blasting • Also cold treating for seasoning and shrink-fitting steels.

5 Special Machinery

Hydraulic Presses — Plastic Molding Presses — Double-End Chamfering Machines



DOUBLE-END DRILLING MACHINES

ALSO STRAIGHTENING MACHINES AND DRILL-PRESS FIXTURES

6 Standard Items

HIGH-SPEED STEEL CENTERS AND TOOL BITS

TAPS

For the difficult tapping operations in our plant we found it expedient to make our own taps. Now we are equipped to design taps for your special needs.

Hardened and Ground **PARALLELS**

● We have made engine mountings for over 5,000 bombers, produced tread-pins for more than 5,000 tanks . . . Agerstrand engineering means proper planning . . . Agerstrand modern machinery expedites production . . Agerstrand's experienced, well-equipped inspection department insures accuracy in high precision parts

7 Machining Facilities

Broach Grinders
Broaching Machs.
Internal Grinders
Surface Grinders
Centerless Grinders
Cylindrical Grinders
Automatic Screw Machs.
Drilling, Tapping, and Boring Machines
Thread Grinders
Milling Machines
Turret Lathes

Agerstrand CORPORATION

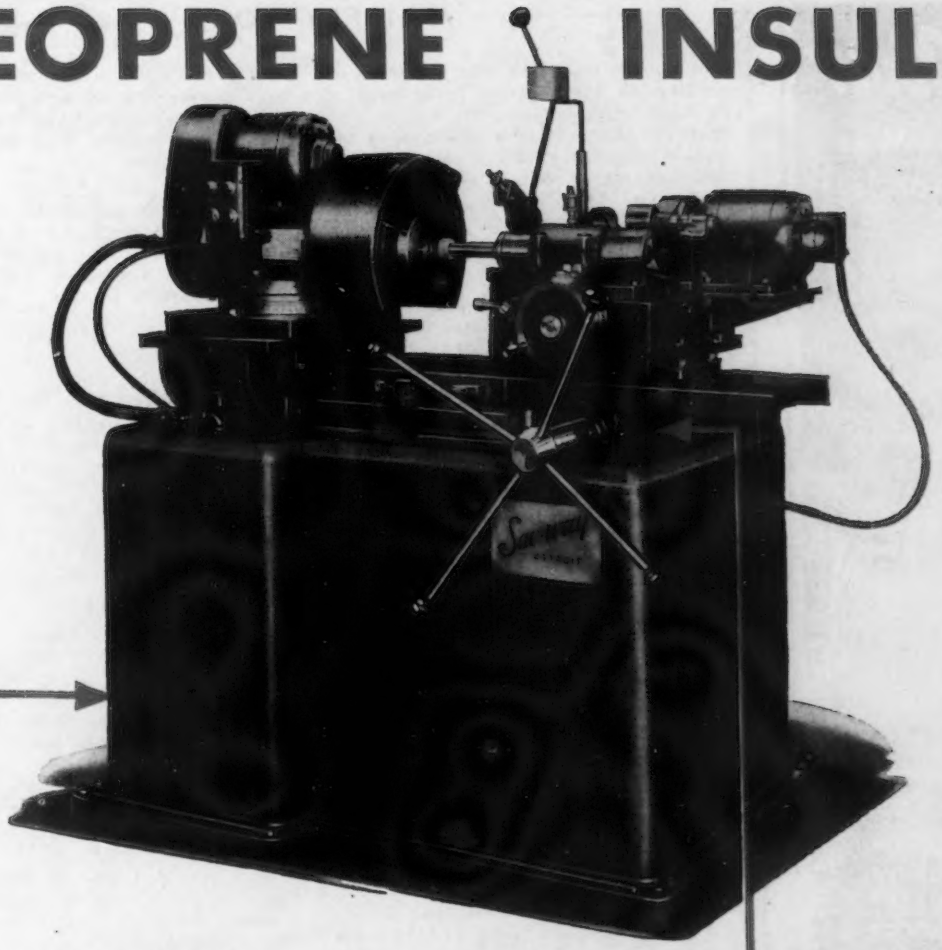
A COMPLETE MANUFACTURING PLANT

AGERSTRAND CORPORATION

MUSKEGON • MICHIGAN

PRODUCTS OF CHARACTER

NEOPRENE INSULATED



against Vibration, Distortion, Misalignment!

This radical departure from conventional design gives the Sav-Way multi-purpose internal grinder a new permanence of alignment and resulting higher accuracy. The bed proper is a thick surface-plate type normalized alloy iron casting of heavily ribbed whale-back construction. Neoprene pads between the bed and the steel base eliminate metal-to-metal contact and absorb floor vibration, preventing distortion of the base being transmitted to the bed, which is accurately scraped. This is only one of seventeen specific features which make the new Sav-Way M-1-A Grinder outstanding in design and construction.

For complete description and specifications, attach the coupon to your letterhead.

Send the Coupon for Your Copy

KEEP AN EYE ON

Sav-way INDUSTRIES

Machine Tool Division

4875 EAST EIGHT MILE · DETROIT, MICHIGAN

PRODUCERS OF SAV-WAY HAND AND HYDRAULIC INTERNAL GRINDERS · SAV-WAY GOLD SEAL SPINDLES · PLUG GAGES · PRECISION AIRCRAFT AND AUTOMOTIVE PARTS

SAV-WAY INDUSTRIES, 4875 E. 8-Mile Road
Detroit, Michigan

Kindly send me a copy of the illustrated folder describing the Sav-Way M-1-A Internal Grinder.

Name_____

Position_____

Firm_____

Address_____

City_____ State_____

HOBART
"Practical Design for Arc Welding"

Here is a service that might easily save you thousands of dollars in giving you ideas on how welding can be used in re-designing your products. A loose leaf service compiled by a well known welding consultant.

Every idea clearly and simply expressed. Hundreds of letters already received telling of its value. Initial pages without cost. Write for them today on your letterhead.

HOBART BROTHERS CO., BOX IA 1031
TROY OHIO

HOBART
"One of the World's Largest Builders of
Arc Welders"

and gun turrets, has been attained, according to the plastics department of E. I. du Pont de Nemours & Co. More than 100 airplane factories are using millions of square feet of this clear, weather-resistant plastic for noses, gun turrets, navigation blisters and all kinds of transparent enclosures on bombers, fighters and other military airplanes.

•

• The back to school movement has put a serious crimp in the labor problem in the Milwaukee area as many employers took on trade school and high school boys and girls during the summer and are finding them difficult to replace. House to house canvassing is being stepped up in the effort to alleviate the labor shortage.

•

• Development of an all-purpose lubricant for automatic screw machines used in the manufacture of bullet cores by Willys-Overland Motors has saved 50,000 gal. of oil for our armed forces during the past three months, according to a recent announcement. Use of the new lubricant has also reduced by 40 per cent the man hours previously expended in oil handling, although the output of the screw machine units in that period was stepped up 23 per cent.

•

• Domestic bookings of electric industrial trucks and tractors during the month of June, 1943, totaled 294 units, figures just released by the Industrial Truck Statistical Association, 208 South LaSalle Street, Chicago, indicate. The net value of chasses only booked during June totaled $1,218,176, compared with $1,355,633 in May.

•

• With 601 employees, the Bessemer Rolling Mill Division of the Tennessee Coal, Iron & Railroad Co., Birmingham, reached 100 per cent employee participation in June, 1942, in the company's war bond payroll savings campaign and has maintained its perfect score ever since.

•

• Faulty combustion in one of the core ovens of Youngstown Alloy Casting Corp. caused an explosion, on Sept. 15, that halted production for three days. Damages were estimated at $3500. The company is engaged in the production of special alloy products used extensively in steel production.

•

• The American Institute of Steel Construction has decided to suspend its students' annual bridge design competition until the war has ended. The competition was inaugurated in 1929.

•

• Those fantastic dreams of tear-drop, rear-engine cars made of "super" materials with curved glass tops and plastic bodies, belong to the next decade, according to Delmar G. Roos, vice-president in charge of engineering for Willys-Overland Motors. He predicts that America's post-war automobiles will be lighter, easier to handle, and will feature small but powerful motors which will deliver more miles per gallon of gasoline.

•

• The Industrial Gas Round Table at the National Metal Congress will be held in the Crystal Room of the Palmer House, Chicago, Oct. 19, at 9.30 a. m. There will be a full program reviewing the technical experiences in applying gas to various metal treating operations under war production conditions and several authorities will speak on plans for industrial gas utilization during the post-war period.

•

• The American Can Co. has devised a slip cover can to protect reeled cable for overseas shipment. Before shipment, the wire is rolled into 17-lb. reels which are inserted into the made-to-order protective jackets. The cans are then sealed with paraffin and packed in wooden cases to withstand the roughest handling.

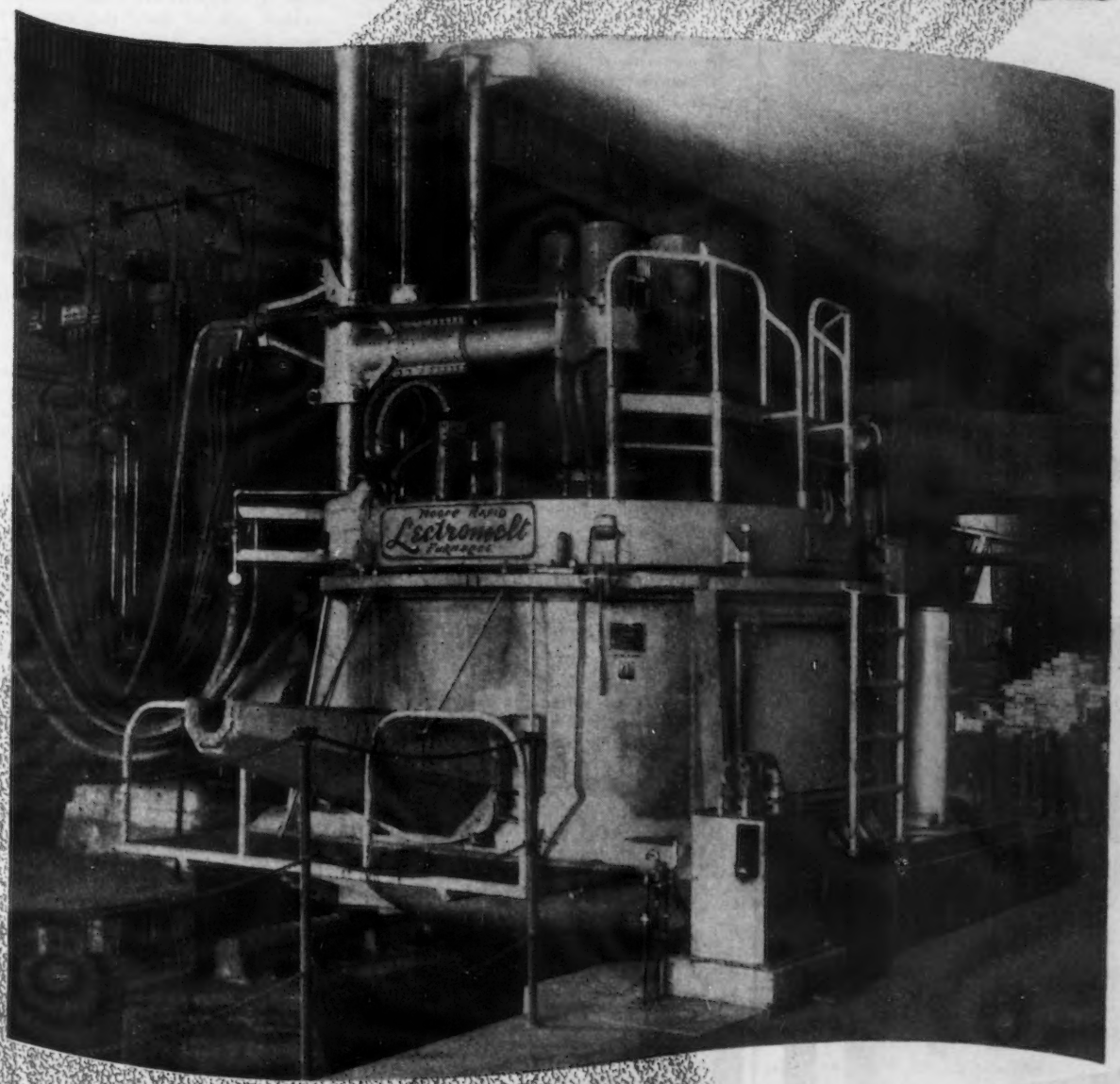
•

• An abandoned limestone quarry at Cobb City, six miles east of Gadsden, Ala., is being reopened to provide Republic Steel Corp. plants in the Gadsden area with an additional source of fluxing stone. Republic, owner of the property, has contracted with Birmingham Slag Co. to operate the quarry. A yield of ap-

HOW BOMBERS GROW: Mammoth hydraulic presses squeeze hundreds of sheets of dural metal into multi-shaped sections which make a bomber fuselage complete. Here one of the presses is shown turning out a section which will be the top window of the pilot's compartment.

Outstanding...

In the Production of War Steels

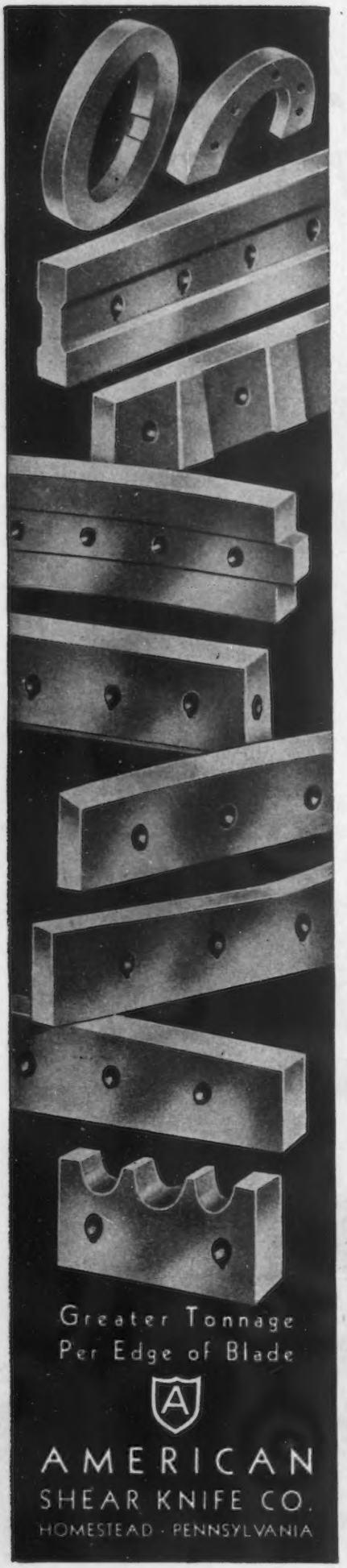


Lectromelt furnaces—for the efficient melting of plain carbon and alloy steels for ingots, and castings, and gray and malleable irons.

ARMY E NAVY

MOORE RAPID *Lectromelt* FURNACES

PITTSBURGH LECTROMELT FURNACE CORPORATION
PITTSBURGH, PENNA.



proximately 20,000 tons of limestone a month is expected.

●

• A new 40-ton electric furnace kicked into operation at the Ambridge plant of A. M. Byers Co. recently. Approximately 85 per cent of steel production will go into materials for the Army, the balance into alloy steel tubing. The new furnace, the Herault type, has a very deep hearth and other improvements that reflect the company's previous experience with electric steel equipment. First heat was delivered by the new unit on Sept. 3. It will operate three shifts a day, seven days a week. The furnace delivers a 40-ton heat every six or seven hr.

●

• Recent records of Milwaukee's branch of the Smaller War Plants Corp. indicate its personnel has visited close to 275 plants in the Milwaukee area and has made nearly 4000 individual contacts keeping smaller firms supplied with work.

●

• The Missouri Pacific Railroad has been authorized to purchase 500 70-ton hopper cars for itself and 200 for the New Orleans, Texas & Mexico Railroad, and 100 40-ft. stock cars for the International-Great Northern Railroad.

●

• In order to help local communities throughout the country to strengthen their economic foundations in readiness for the postwar era, the Department of Commerce has published a handbook called "Community Action for Jobs & Profits." The booklet can be obtained by writing to the New York Regional Office, Department of Commerce, 500 Fifth Avenue, New York 18.

●

• To give war workers a feeling of being vitally important in the war, the Pittsburgh Steel Co. has prepared an illustrated pamphlet showing the relationship between basic materials—blooms, billets, wire and tubes—and the many war materials in which they are used.

●

• With two more of the new Maritime Commission ore boats coming into ore service during the past month, the number of vessels now in American ore trade numbers 314, as against 312 on Aug. 15. Meanwhile, three more Canadian boats came into the American ore trade during the past month, bringing the total to 20. Interlake Steamship Co. and Great Lakes Steamship Co. each put one new boat into service.

●

• The Automotive Council for War Production has established a medical panel composed of factory staff physicians, to exchange information about new problems of employee health and safety, particularly those arising from increasing employment of women and rehabilitated war veterans.

●

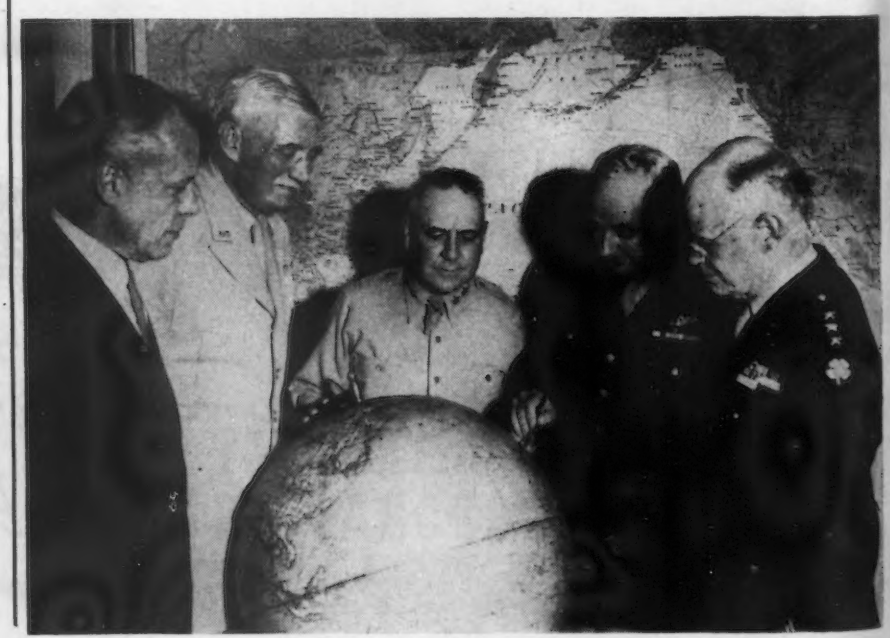
• Philip H. Batchelor, a civilian employee at the Philadelphia Navy Yard, was awarded $700 by the Board on Awards to Civil Employees for developing a means of substituting cellular hard rubber buoyancy units for copper tanks used previously in small boats. The new method renders small boats less subject to sinking by enemy fire or exposure to the elements.

●

• Net earnings for the six months ended June 30, of the National Tool Co., Cleveland, were $357,171 before federal taxes. After deduction of estimated federal taxes of $250,158, net income was $107,013, equivalent to 47c. a share on 224,444 common shares of $1 par value outstanding.

WAR HEADS CONFER: Left to right are Undersecretary of War Robert P. Patterson, Lieut. Gen. W. S. Knudsen, Maj. Gen. Frederick Gilbreath, Lieut. Gen. Delos Emmons and Lieut. Gen. John L. De Witt. Mr. Patterson and General Knudsen are on a tour of the Pacific War Front. General Emmons, it was announced recently, will succeed General De Witt as Commanding General of the Western Defense Command and 4th Army.

International News Photo



P&H

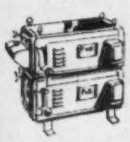
AMERICA'S ONLY MANUFACTURER PROVIDING A COMPLETE WELDING SERVICE

Here, under one roof, the builder of welding equipment is also one of the world's largest users. Pioneers in production welding, P&H has always led the way with new methods and techniques as well as in designing for the welded fabrication.

The new P&H Production Welding Control System will be demonstrated at the Metal Show, Room 813, Palmer House, Chicago, Oct. 18-22, 1943.

PRODUCTION CONTROL SYSTEMS

The P&H system of Production Welding Control can readily be applied to any of the basic methods of compensation to gain accurate control of (1) costs, (2) procedures, (3) production and (4) quality. Originated by P&H and used by other large companies, it is the practical solution to production welding control. Literature on request.

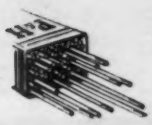


D.C. ARC WELDERS

All with single control and the new "Visi-matic" calibration plate. All P&H arc welders are rated on the WSR (Welding Service Range) basis, which tells you the exact amount of usable welding current, from minimum to maximum, for each machine. Capacities up to 600 amperes.

A.C. ARC WELDERS

A new series of industrial machines (for both intermittent and heavy duty service) with a wide range of capacities. All models provide the continuous, concentrated arc which is so easy to control. The complete line includes models from 20 to 1200-ampere capacity based on WSR ratings.



WELDING ELECTRODES

Produced under rigid quality control in one of America's most modern electrode plants. All sizes and types for maintenance and repair work such as for hard surfacing, resistance to impact, wear, and abrasion. Also for welding stainless, 4-6% chrome steels, armor plates, etc., as well as all types of mild steel electrodes.

WELDING POSITIONERS

A complete line of dual capacity welding positioners up to 24,000 lbs. capacity; power operated for handling various sizes and types of welded structures. New designs provide the utmost simplicity of operation to facilitate production welding. Literature on request.

ELECTRIC HOISTS

Used in welderies everywhere for the handling of steel, sub-assemblies, etc. All capacities up to 15 tons are made in three series of hoists which provide a variety of mountings to suit every need for lifting, lowering, or horizontal travel. Literature on request.

OVERHEAD CRANES

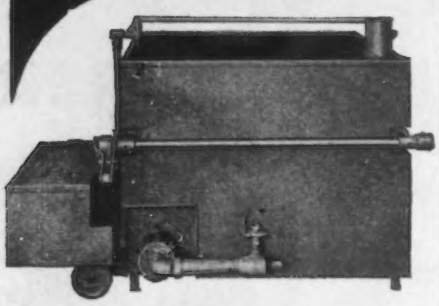
P&H is America's largest builder of overhead cranes. Whether for heavy duty or for intermittent service, P&H builds a size and type exactly suited for each requirement. You can count on P&H's honest delivery dates.

General Offices:
4401 West National Avenue, Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION
ARC WELDERS • EXCAVATORS • ELECTRIC CRANES P&H MOTORS • HOISTS • WELDING ELECTRODES

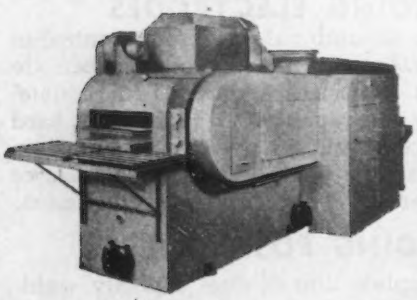
METAL PARTS CLEANING

Low Cost .. Efficient



STURDY - BILT "Simplex"

A small, compact, mechanically simple unit combining ACTIVE-SOAK with WASHING ACTION. Removes oil, grease, chips from metal parts, assemblies, castings, etc. Can be installed individually in different departments or in a series for consecutive steps of cleaning, rinsing, coating or treating. Also the S-B DRYER for complete installation.



STURDY-BILT "Soaker-Hydro"

A unit for positive, production line cleaning of metal parts, etc. Hot SOAKING PROCESS combined with powerful washing section. Equipped with a built-in Drying Unit and Chamber. Parts delivered properly cleaned and dried.

RECENT INSTALLATIONS:

American Lava Corp. (3) Chattanooga, Tenn.
Imperial Brass Co., Chicago, Ill.
Chain Belt Co., Milwaukee, Wis.
General Motors Installations:
Diesel Div., Detroit, Mich.
Saginaw Gear Div., Saginaw, Mich.
Delco Remy Div. (2) Anderson, Ind.
Timken Bearing Corp.
Wisconsin Axle Div. (4) Oshkosh, Wis.
Aircraft Radio Corp., Wright Field, Ohio
U. S. Naval Air Training, Memphis, Tenn.
McCulloch Eng. (Borg-Warner), Milwaukee, Wis.
Western Electric Co., Clifton, N. J.
Martin Rockwell, Jamestown, N. Y.
& Others

Send for complete details on either or both units

STURDY-BILT
EQUIPMENT CORPORATION
Dept. IA-10, West Allis, Wis.

Increased Subcontracting Planned For Electronic Testing Equipment

Washington

• • • **To meet increasing** requirements for electronic test equipment, the Radio and Radar Division plans to increase subcontracting, WPB said recently.

In a letter to electronic test equipment manufacturers, Ray C. Ellis, Radio and Radar Division Director said that the armed services have given notification that requirements for test equipment will increase substantially.

There are several ways of alleviating shortages of test equipment, the letter says. Suggested items for subcontracting include: (1) Those models having relatively small volume of sales. This releases productive capacity for the large volume models requiring the prime contractor's special skill; (2) a part or all of the order for a model having a large backlog; (3) component parts.

Since the expansion of facilities is "impractical for lack of time, construction materials and new personnel," the Radio and Radar Division has conducted two surveys of the industry to discover where there is the most open space on production schedules.

Regional offices have been requested to furnish reports on manufacturers and facilities available for prime or subcontracts for test equipment, test instruments, and components. At the same time, each manufacturer has been asked to indicate which firms would be most capable of handling subcontract work.

NO SMOKING: U. S. Coast Guardsmen stand on the alert with fire extinguishers as the hold of a merchant ship is loaded with 1000 lb. aerial bombs.

Wide World Photo

RUST ?

No Problem if you use...

DEOXIDINE

DEOXIDINE is a time tested phosphoric acid metal cleaner that removes rust chemically from pits as well as from the surface and at the same time destroys or neutralizes rust producers. Deoxidine also removes oil, light oxides, annealing scale, etc., eliminating in many operations the necessity for a separate pickling.

Deoxidine may be applied by dipping, spraying or brushing. There are various types of Deoxidine adapted to the several methods of application and to the cleaning of surfaces with varying amounts of rust and oil.

Deoxidine which introduced the new principle in metal cleaning as long ago as 1916, is a proved material and standard practice.

Write for Service Data Sheet.

Manufacturers of Inhibitors & Metal Working Chemicals

AMERICAN CHEMICAL PAINT CO.
AMBLER ACP **PENNA.**

Note: West Coast Plants may address inquiries and orders for prompt delivery to, Leon Finch, Ltd., 728 East 59th St., Los Angeles, Calif.

American Chemical Paint Company, Ambler, Pa.

Please send me general Technical Service Data Sheets on

☐ Deoxidine

*Name*_____

*Title*_____

*Company*_____

*Address*_____

E-10

Nothing but the best!

. . . for the BATTLEFRONT

THE entire Fairfield organization feels that those on the production front have a solemn obligation to produce only the finest equipment possible for those on the battlefront. The skilled operator pictured above displays the typical painstaking attention that Fairfield men devote to their jobs.

Although the bulk of Fairfield's production is spoken for far in advance, it is possible that we can help fill your gear requirements. It will be considered a privilege to answer your request for information.

TYPICAL PRODUCTS FOR WHICH FAIRFIELD FURNISHES GEARS

Military Equipment
Farm Machinery
Construction Machinery
Mining Machinery
Tractors
Trucks
Diesel Engines
Machine Tools
Oil Field Equipment

FAIRFIELD for FINE GEARS

FAIRFIELD MFG. CO.

305 S. Earl Ave. • Lafayette, Ind.

Among the Week's Trade Notes

Electric Equipment Co. has moved to a new plant at 65 Curlew Street, Rochester, N. Y.

•

Van Norman Machine Tool Co., Springfield, Mass., has changed its name to the Van Norman Co.

•

Austin-Hastings Co., Inc., 226 Binney Street, Cambridge, Mass., has been appointed machine tool representative for all New England except Connecticut for the Taft-Pierce Mfg. Co., Woonsocket, R. I.

•

Claude B. Schneible Co. has moved its main offices from 3951 Lawrence Avenue, Chicago, to 2827 25th Street, Detroit.

•

Concan Ordnance Co., subsidiary of Continental Can Co., Inc., is negotiating with the United States War Department to take over the operation of the Redstone Arsenal, Huntsville, Ala.

•

Carbide Tool Co., Chicago, has named its principal division the Lake Shore Tool Works. Offices and main plant of the new division are located at 816 North Kostner Avenue, Chicago.

Goodyear Tire & Rubber Co. has let contracts for a million dollar addition to its mill at Decatur, Ala.

•

Gillette Rubber Co. plant at Eau Claire, Wis., will be reconverted for the manufacture of tires some time after Jan. 1. It is understood the military personnel will be withdrawn as soon as present small arms ammunition production can be finished up.

•

Plasco Steel Works, Inc., has been organized with headquarters at 303 Empire Bldg., Milwaukee, to deal in steel forgings and machinery.

•

Pump Engineering Service Corp., 11618 Euclid Avenue, Cleveland, was changed to PESCO Products Co. This change has no effect on present personnel or on the company's affiliation with Borg-Warner, the parent company.

•

Detroit Rex Products Co., Detroit, has announced the change of its name to the Detrex Corp.

DPC Authorizes More War Contracts

Washington

• • • **Defense Plant Corp.**, RFC subsidiary, has authorized the following contracts:

Foote Brothers Gear & Machine Corp., Chicago, to provide additional facilities at a plant in Illinois at a cost in excess of $450,000, making a total commitment of more than $10,240,000.

•

Brewster Aeronautical Corp., Long Island, to provide additional facilities at a plant in Pennsylvania at a cost in excess of $160,000, making a total commitment of more than $8,200,000.

•

Rohr Aircraft Corp., Chula Vista, Cal., to provide additional plant facilities in California at a cost in excess of $330,000, making a total commitment of more than $2,900,000.

•

National Carbon Co., Inc., New York, to provide additional facilities at a plant in North Carolina at a cost in excess of $90,000, making a total commitment of more than $600,000.

•

Anaconda Wire & Cable Co., New York, to provide additional plant facilities in Indiana at a cost in excess of $185,000, making a total commitment of more than $540,000.

•

Volco Brass & Copper Co., Kenilworth, N. J., to provide plant facilities in New Jersey at a cost in excess of $415,000.

•

Bendix Aviation Corp., South Bend, Ind., to provide equipment and machinery at a plant in New York at a cost in excess of $255,000.

Ross Carrier Co., Benton Harbor, Mich., to provide equipment and machinery at a plant in Michigan at a cost in excess of $250,000.

•

Iron Fireman Mfg. Co., Cleveland, to provide additional equipment at a plant in Ohio at a cost in excess of $40,000, making a total commitment of more than $230,000.

•

Reynolds Metals Co., Richmond, Va., to provide construction and equipment of a plant in Tennessee at a cost in excess of $16,500,000.

•

Phelps Dodge Copper Products Corp., New York, for construction and equipping of a plant in Indiana at a cost in excess of $13,000,000.

•

United Aircraft Corp., East Hartford, Conn., to provide additional equipment at a plant in Connecticut at a cost in excess of $880,000, making a total commitment of more than $12,350,000.

•

Granite City Steel Co., Granite City, Ill., to provide additional facilities at a plant in Illinois at a cost in excess of $70,000, making a total commitment of more than $11,700,000.

•

Ford Motor Co., Detroit, to provide additional facilities at a plant in Michigan at a cost in excess of $300,000, making a total commitment of more than $800,000.

•

Willamette Iron & Steel Corp., Portland, to provide plant facilities in Orgeon at a cost in excess of $180,000.

•

Robbins Tire & Rubber Co., Inc., Tuscumbia, Ala., to provide equipment at a plant in Alabama at a cost in excess of $75,000.

•

Carlisle Tire & Rubber Co., Carlisle, Pa., to provide equipment at a plant in Pennsylvania at a cost in excess of $28,000.

HOWARD BRONZE

IN THE UNSUNG SERVICE

For sound reasons, little publicity is being given the excellent job being done by American submarines. But in many seas, from the Arctic to the South Pacific, they are steadily depleting the enemy's shipping. In submarines, as in planes and tanks, the land where they were invented is turning out the best.

Many parts of American submarines which must faithfully withstand high pressures and resist corrosion are castings of the most enduring bronze, such as are being turned out in tremendous volume by the bronze division of Howard Foundry Company for submarines, surface craft and other armament parts.

Long before the war, Howard bronze and brass castings enjoyed an enviable name. They will come out of the war with a still more valued reputation.

At the two other Howard foundries an ever-increasing tonnage of magnesium and aluminum castings is being produced — all for war machines to level America's enemies. Combined, these three foundries provide the largest jobbing production of nonferrous castings in America.

When you need nonferrous castings, call on Howard. *For armament today—for utility tomorrow.*

Howard Foundry Company
4900 Bloomingdale Road, Chicago

ARMY E NAVY

HOWARD

ALUMINUM · BRASS · BRONZE · MAGNESIUM

CASTINGS

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS

1942 Record Coke Year Yet Short of Demand; Poorer Quality Noted

Washington

• • • **Although the production** of by-product and beehive coke was greater in 1942 than in any previous calendar year on record, according to a report by the U. S. Bureau of Mines, the demands for coke were not met, and Conservation Order, M-292, which provides for the allocation of coke if it should become necessary, was effected March 12, 1943.

By-product ovens supplied approximately 88 per cent of the tonnage reported and beehive ovens 12 per cent. Production from by-product ovens was 62,294,909 tons which was 3,812,487 tons (7 per cent) greater than their 1941 output and beehive ovens produced 8,274,035 tons, an increase of 1,569,879 tons (23 per cent) more than in 1941.

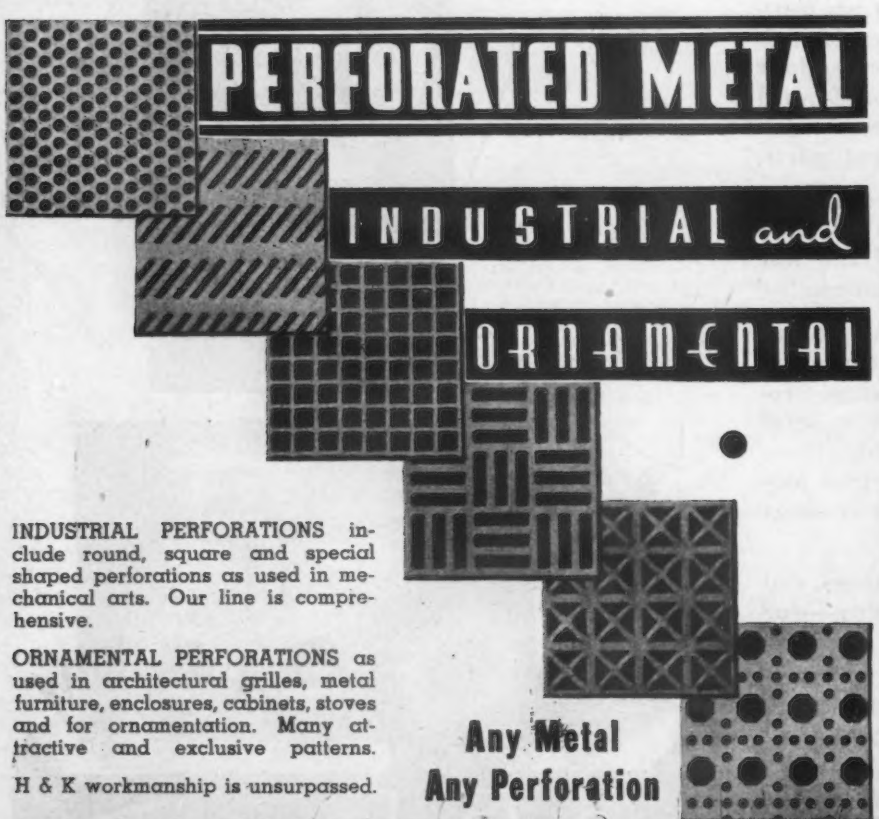
Blast furnace consumption increased from 50,331,675 tons in 1941 to 55,390,133 in 1942, an increase of 5,058,458 tons (10 per cent) and furnaces received 79 per cent of all coke distributed, excluding breeze. This increase in furnace consumption was brought about mainly by additional blast furnace capacity. However, the ratio of coke consumed to production of pig iron increased 3 per cent, and rose from 1745 lb. of coke per ton of pig iron produced in 1941 to 1791 lb. in 1942, and was partly due to the lower quality of coke that the furnaces were forced to use.

Because of this increased ratio it is indicated that the additional coke required to supply the needs of blast furnaces in 1942 amounted to approximately 1,800,000 tons more than if the furnaces had operated at the 1941 rate of coke consumption per ton of furnace output. Since the increase in production of beehive and by-product coke combined was but 8 per cent, it is evident that some of the coke used in blast furnaces was supplied at the expense of other users.

Domestic consumption decreased from 6,660,847 tons in 1941 to 5,926,016 in 1942, a drop of 734,831 tons (11 per cent). Coke delivered to foundries dropped 211,559 tons (8 per cent) below that of 1941 because of the scarcity of pig iron and limitations on castings. (Conservation Order M-17, effective Aug. 1, 1941, placed pig iron under allocation.)

Coke consumed for the manufacture of water gas increased 23 per cent in 1942 and amounted to 2,716,835 tons. Coke used to make producer gas was 822,483 tons, an increase of 32,714 tons (4 per cent) over the 789,769 tons so used in 1941.

Coke used for other industrial purposes, which includes non-ferrous smelting, increased 27 per cent, a greater percentage increase than that of any other classification. The amount so used was 2,679,062 tons in 1942 and 2,105,254 tons in 1941, an increase of 573,808 tons. The largest consumers of coke used in this classification were Pennsylvania, New York, and Michigan.



INDUSTRIAL PERFORATIONS include round, square and special shaped perforations as used in mechanical arts. Our line is comprehensive.

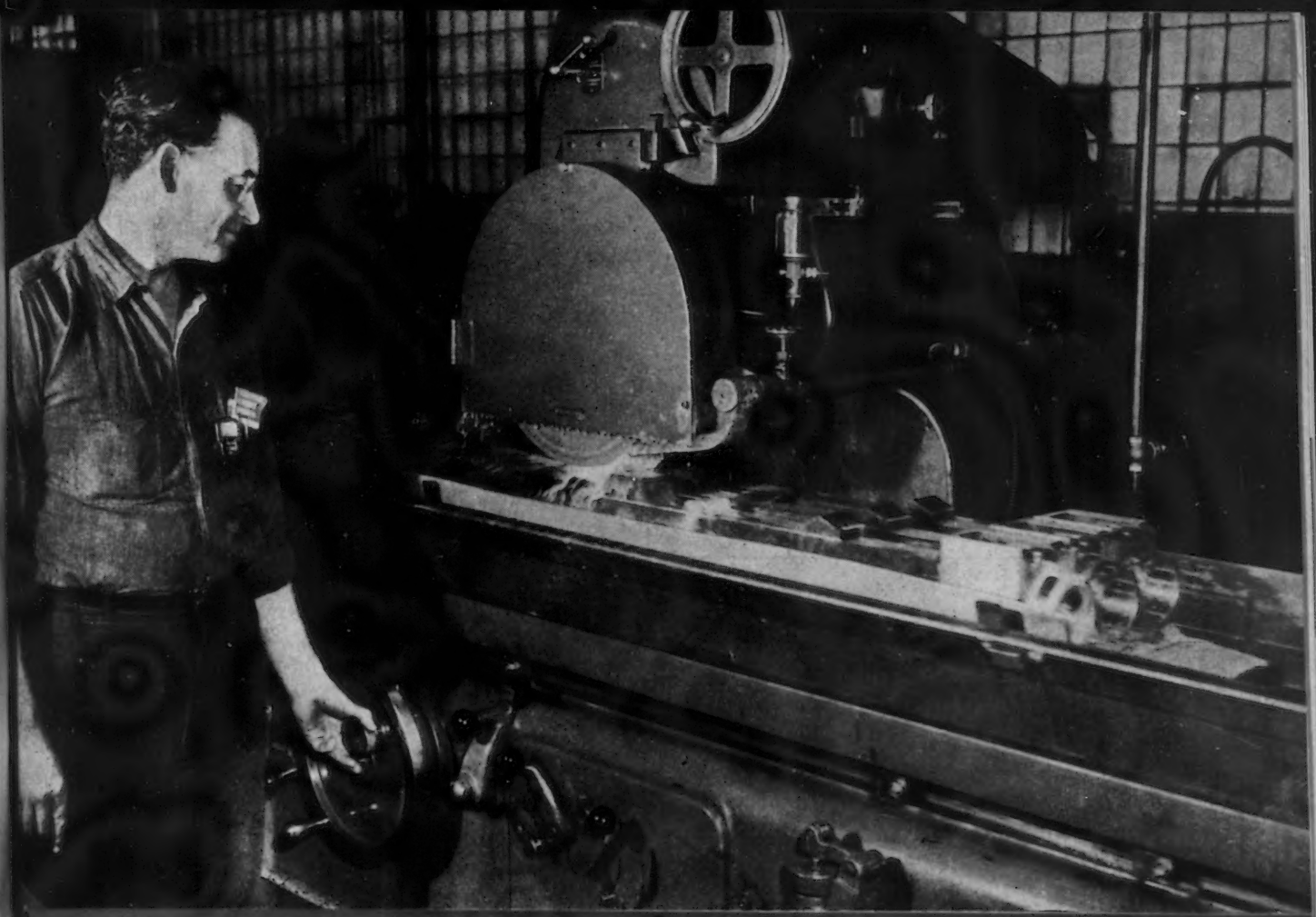
ORNAMENTAL PERFORATIONS as used in architectural grilles, metal furniture, enclosures, cabinets, stoves and for ornamentation. Many attractive and exclusive patterns.

H & K workmanship is unsurpassed.

The Harrington & King Perforating Co.

565 FILLMORE STREET, CHICAGO 44, ILL. Eastern Office: 114 Liberty Street, New York 6, N. Y.

STEEL HIGHWAY: First installation of a "pre-fabricated" steel roadway strip gets its initial coat of road oil surfacing at Darien, Conn.



An Intimate View of a THOMPSON GRINDER *at work*

• Today when precision work means production to tolerances of .0001 thousandth of an inch, Thompson Surface Grinders are helping hundreds of manufacturers to maintain rigid limits of accuracy and obtain remarkably smooth finishes.

The hydraulic drive to grinding wheel, the motor mounted directly to the spindle, the hydraulic table drive, are factors in Thompson design and construction that provide greater power—freedom from vibration—and extreme accuracy.

Illustrated is a Thompson Type C Surface Grinder working 7 days a week on round the clock shifts to meet the demands of War production in one of America's converted automobile plants. Today this Thompson Grinder is producing its share of war materials—accurately—at high speed. Tomorrow it will be available for conversion to production of consumer goods—providing the smooth finish and tolerances that are bound to be demanded of post-war operation.

Consult Thompson on your Grinder Work.

Thompson Grinders are built in a wide range of types and sizes. The largest Type C—36" x 36" x 240".

THE Thompson GRINDER CO.

SPRINGFIELD, OHIO

"Get me some of the new BRASS buttons . . . no more of those old-fashioned pewters!"

BACK in the early eighties, in Connecticut's valley of the Naugatuck, brass founders found themselves teetering on the crest of a sudden wave. High fashion ruled that beaux and belles should no longer be caught dead wearing dull pewter buttons. Bright brass was the new edict.

With this impetus, Yankee progress in brass technology spurted forward. The new industry attracted more experienced men from overseas, demanded new machines and methods for rolling the brass sheet needed in button-making. So brass buttons came to stay . . . and today millions of them carry the U. S. shield on military uniforms. Then other new uses opened up. Brass, for instance, replaced wood in all clock-gears, and here too, it came to stay.

Now as then, in the development of new products . . . whether decorative, functional or industrial . . . the golden-yellow metal simplifies countless problems of design and application by its matchless qualities of adaptability, machinability, durability and appearance. And many are the uses in which no substitute has ever been found for brass, either to the satisfaction of fabricator or consumer . . . *either in war or peace.* And when this war is won, brass will return not only to its traditional uses, but will extend to many new ones. Then Bristol, with its intensive war experience, will be ready to help manufacturers heighten the prospects of many a postwar product . . . such, perhaps, as *yours.*

BRISTOL BRASS

★ ***Buy War Bonds to Buy Brass for Bullets*** ★

THE BRISTOL BRASS CORPORATION, MAKERS OF BRASS SINCE 1850, AT BRISTOL, CONNECTICUT

DoALL BAND FILER

9 Times Faster THAN HAND FILING

For internal *file broaching* the band is opened, inserted through the work and snapped together in only a few seconds.

DoALL Band Filer with motor and all moving parts fully enclosed occupies less than 2½ x 3 feet of space.

An hour's filing job done in six or seven minutes because, with DoALL, filing is merely a matter of *feeding the work!* Metal is removed in clean cut, curved chips constantly while the work is fed against the endless band of precision fit, interlocked, file segments.

New accuracy too! Positive controls of work and file speed permit filing to "die-fit" tolerances—smooth machined finishes—by relatively inexperienced operators.

Investigate the vastly greater efficiency of DoALL Band Filing—in production, tooling or maintenance work—on all metals from tool steel to soft brass and wood, fibre and plastics, too! Telephone your nearest DoALL Sales Office—now!

FREE: Bring or send your filing problem for a complete time-and-method study—*the* DoALL *way.*

DoALL

SALES OFFICES IN 34 PRINCIPAL CITIES

BAND FILER IS MANUFACTURED BY CONTINENTAL MACHINES, INC.

ADDRESS INQUIRIES TO 1301 WASHINGTON AVE., SOUTH, MINNEAPOLIS, MINN.

PERSONALS

• **J. Clark Brown** has been made vice-president in charge of operations at the Federal Supply Co., a subsidiary of Pittsburgh Coal Co. He was formerly in the food business.

• **A. J. Bialosky,** formerly a partner of the Bialosky Bros. & Co., joined the Cleveland staff of Luria Bros. & Co., Inc. Mr. Bialosky had been in retirement.

• **Tinkham Veale, II,** has been appointed production manager of the TOCCO induction process division of Ohio Crankshaft Co., Cleveland. Mr. Veale joined Ohio Crankshaft Co. in 1942 as assistant to the president in charge of production control records. He was formerly associated with Reliance Electric & Engineering Co.

• **J. Frederic Wiese** was elected a vice-president of Lukens Steel Co., Coatesville, Pa. Mr. Wiese will be in charge of the combined sales of Lukens and its two subsidiaries, By-Products Steel Corp. and Lukenweld, Inc. Since June, 1939, Mr. Wiese has been general manager of sales of Lukens Steel Co. and subsidiaries. Before joining Lukens, he was with the Chicago sales office of the Parkesburg Iron Co., Parkesburg, Pa.

• **A. H. Philpot** has been made assistant to the president, Warren Division, Copperweld Steel Co., Warren, Ohio. Mr. Philpot has been in charge of the company's Steel Division office in Washington and will continue to make his headquarters there. Previous to his connection with the company, Mr. Philpot was with the Republic Steel Co.

• **Charles W. Rippie,** has been appointed supervisor of technical service for Diamond Alkali Co. at Painesville, Ohio. He will also collaborate on production, research and sales in the establishment of new products. He was with Monsanto Chemical Co. prior to his present appointment.

• **Louis L. Shapiro** has been appointed plant manager of the Glyco Products Co., Inc., Brooklyn. For the past 14 years he has served as chief chemist; director of the chemical and research departments and assistant superintendent with the Wilson-Martin Division of Wilson & Co., Inc.

• **John I. Yellott** has been appointed full-time director of the Institute of Gas Technology at Illinois Institute of Technology. He succeeds **Harold Vagtborg** as director of the Gas Institute. Mr. Vagtborg will henceforth devote all his time to his duties as director of the Armour Research Foundation.

• **Arthur A. Brandt, George W. Henyan,** and **V. M. Lucas** have recently been appointed to new positions in the electronics department of General Electric Co. Mr. Brandt has been made general sales manager. Mr. Henyan has been made assistant to the vice-president of the department, and Mr. Lucas has been appointed manager of the government division.

• **Dorothie E. Schlect,** former advertising manager for Ohio Tool Co., Cleveland, was recently appointed director of the newly created public relations department of the company. She will supervise all of the advertising, publicity and marketing research for Ohio Tool.

DOROTHIE E. SCHLECT, director of public relations and advertising, Ohio Tool Co., Cleveland.

J. FREDERIC WIESE, vice-president of Lukens Steel Co., Coatesville, Pa.

A. J. BROWN, manager of the Pacific Coast Branch, Los Angeles, Whiting Corp., Harvey, Ill.

• **Charles G. Berwind** has been elected a director of the Pennsylvania Salt Mfg. Co., Philadelphia. He will fill the vacancy caused by the death of William M. Potts. Mr. Berwind is vice-president and director of the Berwind-White Coal Mining Co.

• **Russell R. Kilburn** was appointed resident manager of the Toledo office of Harold Van Doren & Associates. Mr. Kilburn was formerly industrial designer for Walter Dorwin Teague of New York.

• **A J. Brown** has been placed in charge of the Pacific Coast Branch of the Whiting Corp., Harvey, Ill. Before joining Whiting Mr. Brown did engineering work with the Allis-Chalmers Mfg. Co. His new office will be at 1151 S. Broadway, Los Angeles.

THOMAS I. PHILLIPS, director of the Pittsburgh Divisions, Westinghouse Electric & Mfg. Co., Pittsburgh.

FRED H. CURRIE, manager of sales for the Pacific Coast, Copperweld Steel Co., Warren, Ohio.

• **Thomas I. Phillips,** vice-president of the Westinghouse Electric & Mfg. Co., has been made head of the company's Pittsburgh Divisions. Mr. Phillips, who started with Westinghouse in 1915 as a tool maker, succeeded **A. C. Streamer** who was named assistant to the president with headquarters in Pittsburgh. Mr. Phillips was elected a vice-president in 1941.

• **Kenneth Freedell** has been granted a leave of absence from Stanley Tools, New Britain, Conn., to take over a position with the WPB in Washington, D. C. He is now associated with the hardware and small tools section of the Building Material Division, WPB. Mr. Freedell was assistant to the sales manager at Stanley Tools.

• **C. C. Banholzer** has been appointed central Wisconsin representative for the Irving Subway Grating Co., Long Island, N. Y., to succeed the late W. H. Reinke. The Irving firm also has appointed **J. J. Somes** in the Chicago district to replace **A. G. McNerney,** now in the armed forces.

• **Bert H. Norem** has been appointed assistant professor of administrative engineering in the College of Applied Science, Syracuse University, Syracuse, N. Y. He was formerly an industrial engineer with the Carrier Corp.

• **M. J. Graham** has been appointed manager of manufacturing, International Harvester Co. For the past three years Mr. Graham has been works manager in charge of the motor truck group of Harvester plants and has been supervisor of several of the company's most important war production operations. Mr. Graham has been with the company for nearly 37 years, having started as an office boy at the West Pullman works in December, 1906.

• **Robert M. Reid** has been appointed traffic manager of the Tennessee Coal, Iron & Railroad Co., Birmingham. Mr. Reid, who became associated with the company in 1917 as a rate clerk in the traffic department, was made chief of rate clerks in 1922 and assistant traffic manager in 1941.

• **J. N. Hanes** has been appointed general baggage agent with the Norfolk & Western Railway Co. He joined the company in 1904 as a stenographer. Prior to his present position he was chief clerk in the passenger traffic department.

• **Marshall Haislup** was appointed manager of the export department, E. C. Atkins & Co., Indianapolis. Mr. Haislup, who has been with the company for 22 years, started as a mail boy in the office of the president. He succeeds A. J. Nugent, former manager of the export department. **George Hunter,** formerly business manager of the armor plate division of the company, recently was appointed sales manager of the industrial division, succeeding **R. F. Ellis.**

• **Fred H. Currie** has been appointed manager of sales for the Pacific Coast for Copperweld Steel Co., Warren, Ohio. Mr. Currie, who was formerly with Timken Roller Bearing Co., will have his offices at 403 West Eighth Street, Los Angeles.

• **David M. Salsbury** has been appointed general manager of the Westinghouse Electric Supply Co., New York. Mr. Salsbury had been manager of the company's North Pacific district with headquarters at Seattle, Wash. At the same time, **William M. Jewell,** formerly acting manager at Detroit and manager at San Francisco, was appointed district manager at Seattle, and **John H. Fisher** was made Middle Atlantic district manager with headquarters at Philadelphia.

OBITUARY...

• **William S. Harley,** motorcycle engineer and designer, died suddenly Sept. 18. It was while Mr. Harley was an engineer at the Wisconsin Bridge & Iron Co., in 1908 that he and the three Davidson brothers, Arthur, Walter and William, founded the Harley-Davidson Motor Co.

• **David C. Voyle,** secretary and treasurer of the Scranton Supply & Machinery Co., Inc., Scranton, Pa., died Sept. 18. Mr. Voyle had been associated with the company for 46 years. He was 67 years of age.

• **Charles Franklin Morgan,** secretary of the Emory Pipe & Fittings Co., Anniston, Ala., drowned Sept. 18 in Alabama's Talladega National Forest while on a fishing trip. He was 46 years of age.

• **George Tallman Ladd,** president of United Engineering & Foundry Co., died at Pittsburgh Oct. 3. Mr. Ladd's first association was with the Motive Power Division of the Pittsburgh & Lake Erie Railroad Co., Pittsburgh. From 1910 to 1925 he was head of his own engineering firm at Pittsburgh, and was president of the Ladd Water Tube Boiler Co. from 1925 to 1928. During this period he made numerous contributions to the application of high pressure steam generating units in modern power plants. Mr. Ladd became president of the United Engineering & Foundry Co. in 1928. He was chairman of the board of the Pittsburgh Testing Laboratory, and Woodings-Verona Tool Works, Verona, Pa., and president and treasurer of the Ladd Equipment Co., Pittsburgh. He was also chairman of the executive committee of the Pennsylvania-Central Airlines, and a member of the executive committees of Pittsburgh Steel Co., National Supply Co., Follansbee Steel Corp., Westinghouse Airbrake Co., Union Switch & Signal Co., and several others.

MACHINE TOOLS

. . . News and Market Activities

Cleveland Automatic Lend-Leases Workers

Cleveland

• • • **In an attempt to assure** itself of sufficient skilled help after a conversion from machine tools to another type of product and also to protect the seniority and rights of its workers, the Cleveland Automatic Machine Co. this week started a farming-out program that will involve moving about 300 of its 1500 employees into plants of other manufacturers in the city on a lend-lease basis. The conversion now under way at Cleveland Automatic's plants is from its normal line of automatic screw machines to the manufacture of industrial lift trucks on a license arrangement with Clark Equipment Co., Buchanan, Mich. The actual contracts for these trucks are held with the Army and Navy.

In addition to maintaining the production of automatic screw machines and starting production of industrial lift trucks, Cleveland Automatic also manufactures die-casting equipment. This line of products was acquired by the recent purchase of the G. & N. Mfg. Co., and shipments are now being made. The basic die casting machine made is identical for all types of metals that are formed by this method, but by changing the hot metal end of the machine, either the magnesium-brass-aluminum castings or the lead-zinc, tin castings can be made.

The addition of the production line for industrial trucks will be attempted on the basis that automatic screw machines will remain the company's chief product, and the new line will not interfere too much with machine tool production. The actual farming out of skilled help is being carried on in order that there will be at least the semblance of a "well of skilled help" that can be drawn upon in about three months, when the conversion is expected to be completed. At that time, as many of the employees as will come back will be re-employed in Cleveland Automatic plants, and the contract work on the Clark truck is expected to keep production at capacity until the end of the war.

Employees are being placed in other plants through the efforts of both the company and the United States Employment Service. As far as is possible, these employees are being placed at their existing income levels and at plants as conveniently located for the men as possible. The efforts of the U.S.E.S. in the matter has been purely in a liaison capacity, bringing Cleveland Automatic together with plants that are in need of skilled help and in working out the details of the transfer. While employed by other firms, Cleveland Automatic workers will maintain full seniority, vacation and other rights.

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Stiffened Attitude on Pool Orders Noticed

Cincinnati

• • • **Some machine tool manufacturers** have noticed a tightening attitude on the part of Washington officials on pool orders. Heretofore, when a firm order from some consumer came in, the particular machine was eliminated from the pool order and the government's interest transferred to the new buyer. In some instances, where buyers cancelled these orders, upon request made to Washington the cancelled machine was put back in the pool. Currently, however, government officials have been tending to take a rather technical attitude toward such situations. Of course, manufacturers have anticipated a stronger attitude as the emergency for tools declines, since the government naturally will not want to take title to any more machine tools than they absolutely have to, but the present attitude is definite indication that Washington feels that the heyday of machine tool ordering has passed. On the other hand, manufacturers indicate a very good buying interest on the part of general users of machine tools, should they be able to get the proper authorization under the priorities rulings.

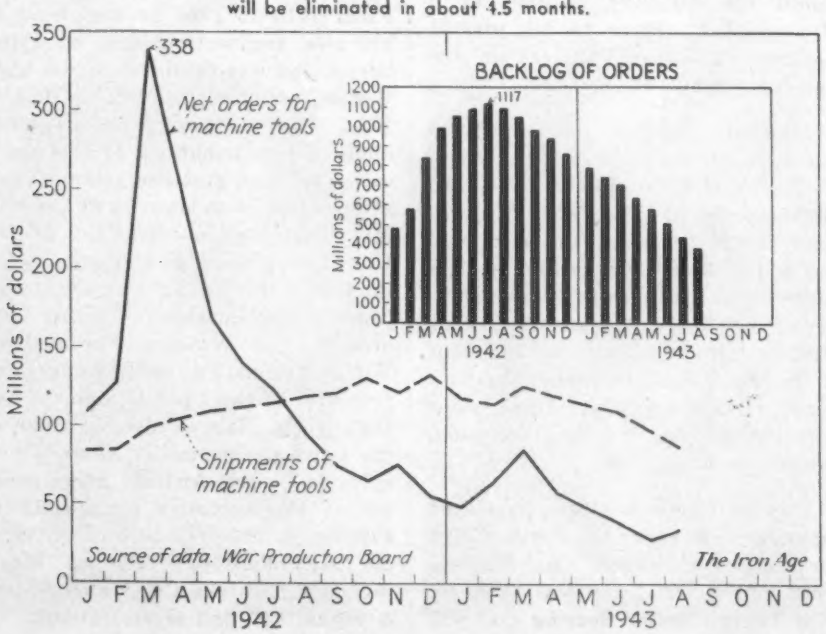
•

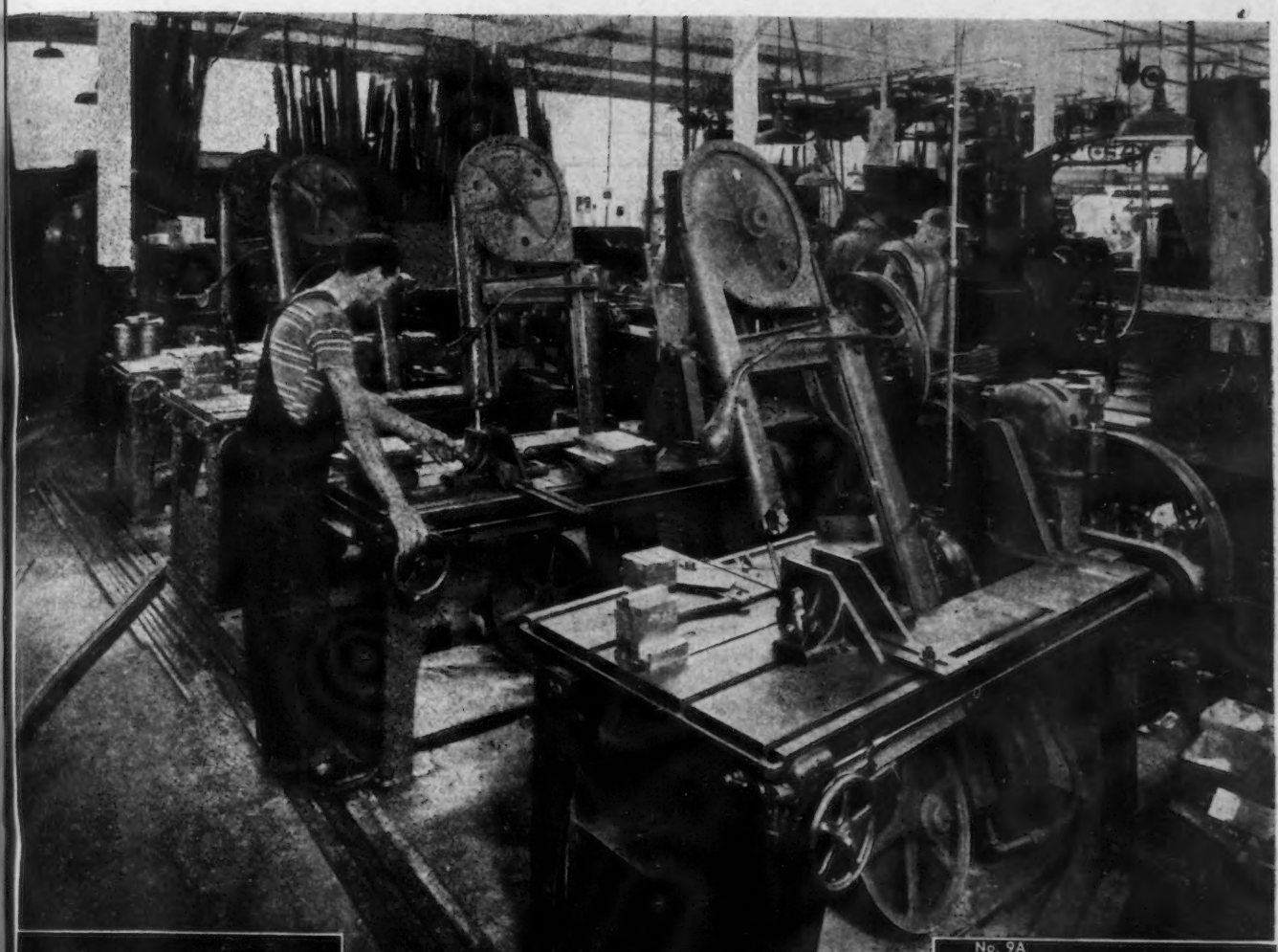
Band Saw Blade Shipments Up

• • • **Shipments of band saw blades** during August were valued at $622,000, an increase of $67,000 or approximately 12 per cent over July of this year, according to the WPB. Unfilled orders on hand Aug. 31 were $730,000. During the first half of 1943 shipments and new orders decreased 9 per cent in value compared with the last six months of 1942.

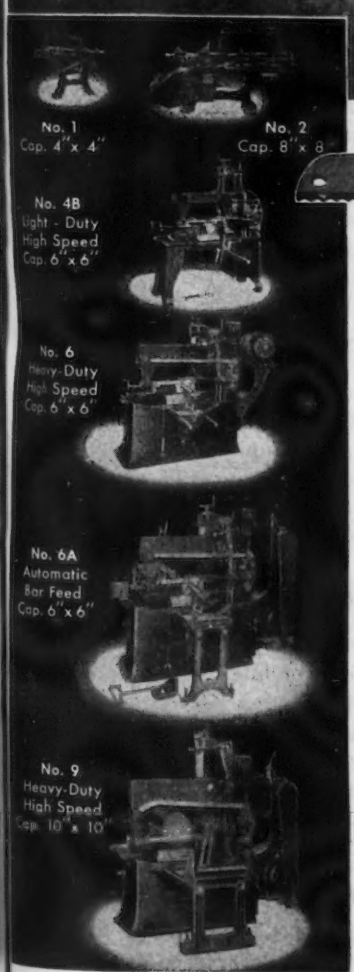
August Machine Tool Shipments Down, Net Orders Up

• • • **August machine tool shipments were valued at $87,827,000, down 10 per cent from July totals of $97,541,000, according to the Tools division of WPB. Orders received during August were valued at $40,192,000, or 3 per cent less than July's order total of $41,447,000, but since August cancellations were $6,814,000 against the July total of $12,834,000, net new orders for August, at $33,378,000, were 16.2 per cent higher than for July, when they totaled $28,713,000. Backlogs of accumulated orders at the end of August were valued at $386,792,000, a decline of about 12.3 per cent from the July backlog of $441,220,000. At the August rate of shipments, this backlog will be eliminated in about 4.5 months.**





MARVEL SAWS



Accurate, Fast, Dependable and each cutting at a different angle

One of the universal features of MARVEL No. 8 Metal-cutting Band Saws is well illustrated in the above picture taken at the Gorham Tool Company, Detroit. Here a battery of 4 MARVEL No. 8's attended by a single operator, are all busily cutting-off tool bits from nested high speed steel shapes, *and each is cutting at a different angle.* These MARVEL No. 8's are also used by this firm for cutting-off blanks for side and end mills, and for cutting out crank shaft tools, form tools and dovetails. Handling work to 18" x 18" cross section, almost any type cut, these universal tools have proven "very economical on splitting operations, accurate, fast and dependable."

ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

5700 Bloomingdale Ave. Chicago, U. S. A.

Eastern Sales Office: 225 Lafayette St., New York

NON-FERROUS METALS

. . . News and Market Activities

Copper Supply and Demand Balance

• • • **The latest report** of the Combined Copper Committee to the joint Washington meeting of the Combined Raw Materials Board and Combined Production and Resources Board shows that the supply of copper and its present actual consumption by the United Nations have now reached a rough balance. The gap between future supply and demand as forecast by the committee two months ago has been materially lessened and emphasis has shifted to manpower in United States brass mills.

One of the reasons for the improved supply position is that stocks of copper have been accumulating at brass mills owing to operation of the mills at less than capacity, due to lack of adequate manpower.

The meeting received the assurance of WPB Chairman Donald M. Nelson that action is being taken, in conjunction with the War Manpower Commission, to remedy the manpower situation in the brass mills of the Connecticut Valley by measures similar to those now being put into effect on the West Coast.

But a number of other factors of a more positive character both as to supply and use, has contributed to the more favorable stock position, according to the report: Demand as forecast some months back necessarily took into account possible heavy sinkings of ships carrying ore and copper products. The position in this respect recently has been much improved. The collection of copper scrap in the United States, it now appears, will exceed previous expectations, and shipments from Africa to the United Kingdom have been speeded up owing to the resumption of Mediterranean routes.

On the consumption side, stated requirements for certain kinds of ammunition have been substantially reduced and the use of steel for shell cases is increasing. All of these factors have helped bring supply and demand into balance. The committee emphasized, however, that this balanced position is dependent on maintaining existing and projected production rates of new copper, the collection of scrap and the acceptance of the steel cartridge cases.

France Faces Serious Metal Shortages

• • • **France's endeavors** to institute a planned economy are meeting with typical and serious difficulties as regards metals, which are in terribly short supply, *Metal Bulletin*, London, reports. Nonferrous metals, particularly copper and nickel, which are normally imported entirely from abroad, were put under a compulsory collection system at a comparatively early stage after the armistice. During the past two years, intensified efforts have been made to get the French public to surrender old metals, including worn-out household articles of nonferrous metals. One of these campaigns included the famous "copper for wine" offer. Those who voluntarily delivered a specified quantity of copper, brass or other copper alloys, received a permit to buy cheap table wine. According to unofficial figures, during 1942 nearly 10,000 tons of copper or about one tenth of the French prewar consumption were recovered and thus at least the most pressing copper sulphate needs of the French farmers were met.

A decree law dated Aug. 28, 1942, subsequently "mobilized" all stocks of nonferrous metal articles containing more than 30 per cent of copper, lead, tin, zinc and nickel. With the exception of indispensable parts of machinery, tools, and industrial and commercial plant installations, all nonferrous metals were "frozen" with immediate effect, that is, such metal could not be disposed of without official permission or even used in the works themselves. A supplementary decree of Jan. 26, 1943, ordered the registration and segregation of the metal coming under the order. The returns, however, are believed to have been somewhat incomplete. The seizure of such metals appears to have taken place up to the present only in the case of restaurants, bars and bistros, which, very much against the will of the proprietors, were forced to surrender the dispensable metal from their counters—the so-called zincs made of copper or zinc—and to replace these with wood or other less scarce materials. So far forced entrance into private and industrial businesses has been avoided on psychological grounds. On the other hand, a special decree was issued laying down a general "metal tax," whereby every taxpayer had to remit a quota of scrap copper, brass, zinc, lead or tin according to his income and his standard of living. It was recognized, however, that payment in metal is not always easy, and accordingly provision was made whereby payment could be made by means of a supplementary money tax; it is understood that nine in ten taxpayers have been taking advantage of this concession, particularly when it became known what high prices scrap copper, brass and lead were getting on the black market. Meanwhile, innumerable regulations destined to economize in the use of metals, which have led to a virtual stoppage of manufacture of many articles, have been unable to prevent an intensification of the nonferrous metal famine.

It appears that since early Spring of this year the shortage of lead, copper and tin has become really catastrophic. The latest copper collection campaign was only adequate to add a few thousand tons to the quarter's supply, according to a Paris press statement of May 8. In the case of lead the position is in no way more favorable, though there remains a small stock from the French North African output of 1942. Likewise the current zinc production (which amounted in 1938 to 61,200 metric tons) is quite insufficient, and negotiations for the importation of zinc from Italy and Spain are hanging fire. In such circumstances there is no alternative to the still more drastic rationing and recovery of scrap metals.

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Zinc Conservation Eased

• • • **Use of zinc** for items not specifically prohibited in List A attached to Conservation Order M-11-b has been set by WPB at 15 per cent by weight per quarter of the amount of zinc products used by a person during the entire calendar year 1941, through revision of the Order M-11-b, effective Oct. 1. The order previously permitted processing during a quarter of 50 per cent of the amount of zinc used in the corresponding quarter of 1941.

Refiner, Smelter Quotations

(Cents per lb.)

Copper, electrolytic, Conn. Valley	12.00
Copper, electrolytic, New York	11.75
Copper, Lake	12.00
Tin, Straits, New York	52.00
Zinc, East St. Louis	8.25
Zinc, New York	8.67
Lead, St. Louis	6.35
Lead, New York	6.50
Aluminum, virgin 99+%, delivered	15.00
Nickel, electrolytic, base refinery	35.00
Magnesium, 99.9+%, carlots	21.50
Magnesium, 12-in. sticks, carlots	30.00
Cadmium, delivered	90.00

ALUMINUM, No. 12 foundry grade (No. 1), 13.50c. per lb.; steel deoxidizing grades, 12.50c. to 13.75c. per lb. ANTIMONY, Asiatic, New York, nominal; American, 14.50c. a lb., f.o.b. Laredo, Tex., smelter. MERCURY, $191 to $193 per 76-lb. flask, f.o.b. shipping point or port of entry. BRASS INGOTS, commercial 85-5-5-5 (No. 115), 12.25c. a lb. COBALT, 97 to 99 per cent, $2.11 per lb. BERYLLIUM COPPER, 3.75 to 4.25 per cent Be., $15 per lb. contained Be. GOLD, U. S. Treasury, $35 an oz. INDIUM, 99.5 per cent, $10 per troy oz. IRIDIUM, $165 per troy oz. PALLADIUM, $24 per troy oz. PLATINUM, $35 per oz. SILVER, open market, New York, 44.75c. per oz. ARSENIC, prime, white, 99 per cent, 4c. per lb.

Copper, Copper Base Alloys

(Mill base prices)

Sheet: Copper, 20.87c.; high brass, 19.48c.; low brass, 80 per cent, 20.15c.; red brass, 85 per cent, 20.36c.; commercial bronze, 90 per cent, 21.07c., 95 per cent, 21.28c.; manganese bronze, 28.00c.; Muntz metal, 22.75c.; naval brass, 24.50c.; phosphor bronze, grades A, B, 5 per cent, 36.25c.; Everdur, Herculoy, Olympic or equivalent, 26.00c.; nickel silver, 5 per cent, 26.50c.

Rods: Copper, hot rolled, 17.37c.; drawn, 18.37c.; free cutting brass, 15.01c.; low brass, 80 per cent, 20.40c.; red brass, 85 per cent, 20.61c.; commercial bronze, 90 per cent, 21.32c., 95 per cent, 21.53c.; Muntz metal, 18.87c.; naval brass, 19.12c.; phosphor bronze, grades A, B, 5 per cent, 36.50c.; Everdur, Herculoy, Olympic or equivalent, 25.50c.; nickel silver, 5 per cent, 28.75c.

Extruded Shapes: Copper, 20.87c.; architectural bronze, 19.12c.; manganese bronze, 24.00c.; Muntz metal, 20.12c.; naval brass, 20.37c.

ALUMINUM

Tubing: 2 in. O.D. x 0.065 in. wall 2S, 49c. per lb. (½H); 52S, 61c. (O); 24S, 67½c. (T).

Plate: 0.250 in. and heavier: 2S and 3S, 21.2c. per lb.; 52S, 24.2c.; 61S, 22.8c.; 24S, 24.2c.

Flat Sheet: 0.188 in. thickness; 2S and 3S, 22.7c. a lb.; 52S, 26.2c.; 61S, 24.7c.; 24S, 26.7c.

2000-lb. base price for tubing; 30,000-lb. base price for plate, flat stock. Variations from the above gage, size, temper, finish and quantity require extras.

Extruded Shapes: "As extruded" temper; 2000-lb. base price. 2S and 3S, factor No. 1 to 4, 25.5c. per lb.; 14S, factor No. 1 to 4, 35c.; 17S, factor No. 1 to 4, 31c.; 24S, factor No. 1 to 4, 34c.; 53S, factor No. 1 to 4, 28c.; 61S, factor No. 1 to 4, 28½c.

The factor is determined by dividing perimeter of shape by the weight per lineal foot. All prices above are subject to factor number range, temper, length, dimensional tolerances and quantity extras.

Wire, Rod and Bar: Base price; 17ST and 11ST-3, screw machine stock. Rounds: ¼ in., 28½c. per lb.; ½ in., 26c.; 1 in., 24½c.; 2 in., 23c. Hexagonals: ¼ in., 34½c. per lb.; ½ in., 28½c.; 1 in., 25½c.; 2 in., 25½c. 2S, as fabricated, random or standard lengths, ¼ in., 34c. per lb.; ½ in., 25c.; 1 in., 24c.; 2 in., 23c. 24ST, rectangles and squares, random or standard lengths, 0.093-0.187 in. thick by 1.001-2.000 in. wide, 33c. per lb.; 0.751-1.500 in. thick by 2.001-4.000 in. wide, 29c.; 1.501-2.000 in. thick by 4.001-6.000 in. wide, 27½c.

Variation from the above size, temper, finish and quantity require extras.

MAGNESIUM

Sheet, rod, tubes, bars and extruded shapes are subject to individual quotation. Magnesium Metal Turnings: 100 lb. or more, 46c. a lb.; 25 to 90 lb., 56c.; less than 25 lb., 66c a lb.

NON-FERROUS SCRAP METAL QUOTATIONS

Copper, Copper Base Alloy

(Current OPA maximum prices, cents per lb., f.o.b. point of shipment, plus premiums for quantities and special preparation.)

OPA Group 1

No. 1 wire, No. 1 heavy copper	9.75
No. 1 tinned copper wire, No. 1 tinned heavy copper	9.75
No. 2 wire, mixed heavy copper	8.75
Copper tuyeres	8.75
Light copper	7.75
Copper borings	9.75
Lead covered copper wire, cable	6.00*
Lead covered telephone, power cable	6.04
Insulated copper	5.10*

OPA Group 2

Bell metal	15.50
High grade bronze gears	13.25
High grade bronze solids	11.50*
Low lead bronze borings	11.50*
Babbitt lined brass bushings	13.00
High lead bronze solids	10.00*
High lead bronze borings	10.00*
Red trolley wheels	10.75
Tinny (phosphor bronze) borings	10.50
Tinny (phosphor bronze) solids	10.50
Copper-nickel solids and borings	9.25
Bronze paper mill wire cloth	9.50
Aluminum bronze solids	9.00
Soft red brass (No. 1 composition)	9.00
Soft red brass borings (No. 1)	9.00
Gilding metal turnings	8.50
Unlined standard red car boxes	8.25
Lined standard red car boxes	7.75
Cocks and faucets	7.75
Mixed brass screens	7.75
Red brass breakage	7.50
Old nickel silver solids, borings	6.25
Copper lead solids, borings	6.25
Yellow brass castings	6.25

OPA Group 3

Yellow brass soft sheet clippings	8.625
Yellow rod brass turnings	8.375
Zincy bronze borings	8.00
Zincy bronze solids	8.00
Fired rifle shells	8.25
Brass pipe	8.00
Old rolled brass	7.75
Admiralty condenser tubes	8.00
Muntz metal condenser tubes	7.50
Plated brass sheet, pipe reflectors	7.50
Manganese bronze solids	7.25[1] 6.25[2]
Manganese bronze borings	6.50[1] 5.50[2]

OPA Group 4

Automobile radiators	7.00

OPA Group 5

Refinery brass	5.00*

*Price varies with analysis. [1] Lead content 0.00 to 0.40 per cent. [2] Lead content 0.41 to 1.00 per cent.

Aluminum

(Current OPA maximum prices, cents per lb., for less than 1000 lb. lots, f.o.b. point of shipment, plus premiums for quantities and special preparation.)

Plant scrap, segregated

2S solids	9.00
All other solids	8.50
Borings and turnings	
Wrought alloys (17S, 18S, 32S, 52S)	7.50
High grade alloys	7.00
Low grade alloys	6.50

Plant scrap, mixed

All solids	7.50
Borings and turnings	5.50

Obsolete scrap

Pure cable	9.00
Old sheet and utensils	7.50
Old castings and forgings	8.00
Pistons, free of struts	8.00
Pistons, with struts	6.00
Old alloy sheet	7.00

For lots of 1000 to 19,999 lb., add 1c. to above prices except for old castings and forgings, pistons free of struts, pistons with struts and old alloy sheet for which there is a premium of ½c. a lb. For lots over 19,999 lb. add 1½c. a lb. to prices listed.

Magnesium

Segregated plant scrap

Pure solids and all other solids, exempt	
Borings and turnings	8.00

Mixed, contaminated plant scrap

Grade 1 solids	11.00
Grade 1 borings and turnings	7.00
Grade 2 solids	9.00
Grade 2 borings and turnings	5.00

For lots over 1499 lb. add 1c. per lb.

Zinc

(Current OPA maximum prices, cents per lb., f.o.b., shipping point.)

New zinc clippings, trimmings	7.25
Engravers', lithographers' plates	7.25
Old zinc scrap	5.75
Unsweated zinc dross	5.80
Die cast slab	5.80
New die cast scrap	4.95
Radiator grilles, old and new	4.95
Old die cast scrap	4.50

Lead

Soft and hard lead, including cable lead, f.o.b. point of shipment, deduct 0.55c. per lb. from basing point prices for refined metal.

Nickel

Nickel content 98 + per cent, copper under ½ per cent, 26c. per lb.; 90 to 98 per cent nickel, 26c. per lb. contained Ni.

ELECTROPLATING ANODES AND CHEMICALS

Anodes

(Cents per lb., f.o.b. shipping point)

Copper: Cast, elliptical, 15 in. and longer	25⅛
Electrolytic, full size	22⅞
cut to size	30⅛
Rolled, oval, straight, 15 in. and longer	23¼
Curved	24¼
Brass: Cast, 82-20, elliptical, 15 in. and longer	23⅝
Zinc: Cast, 99.99, 16 in. and over	16¼
Nickel: 99% plus, cast	47
Rolled, depolarized	48
Silver: Rolled, 999 fine per Troy (1-9) oz., per oz.	58

Chemicals

(Cents per lb., delivery from New York)

Copper cyanide, tech., 100-lb. bbls. 1-5	5.65
Copper sulphate, 99.5 crystals, bbls.	13.00–13.50
Nickel salts, single, 425-lb. bbls.	34.00
Silver cyanide, 100 oz. lots	40.82–41.125
Sodium cyanide, 96% dom., 100-lb. dms.	0.15
Zinc cyanide, 100-lb. dms.	33.00
Zinc sulphate, 89% crystals, bbls.	6.80

SCRAP

. . . News and Market Activities

Western Scrap Hit by Fontana Plant

San Francisco

• • • **Southern California** and the Pacific Southwest, traditionally a plus area for scrap, has become consistently minus by reason of the demand of the Fontana steel plant. Although prudent purchasing policy under present conditions justifies 90-day stockpiles for mills in this area, both Columbia at Torrance and Bethlehem at Los Angeles are now drawing on their 60-day normal surplus. Moreover, the demand is so depleting nonrecurrent sources in Arizona, from 300 to 600 rail miles away, that local foundries there are desperately short.

Although the Pacific Northwest, at Portland, Seattle and Spokane, continues a plus area with moderate reserves in storage, the trade believes that new facilities in that area and in California and Utah will absorb this reserve within the next few months. Central California and the San Francisco Bay area are evenly balanced at the present time, but there is apprehension that there will be shortages within the next three or four months.

Cast iron scrap continues desperately short and grey iron foundries are handicapped all over the Pacific slope. Government men in the salvage division hope that 10 per cent of the anticipated returns from the imminent scrap drive will be cast iron and will help to relieve the shortage at least temporarily.

o o o

Cast Scrap Shortage Near Critical

• • • **Steelmaking scrap continues** this week to cause no particular concern except for a marked about-face in supply conditions on the West Coast. On the other hand, cast scrap, which has been reported exceedingly short in various areas for some months, has now reached a near critical point and is termed short or nearly non-existent in the majority of sections reporting.

Southern California and the Pacific Southwest, traditionally plentiful with scrap, are reporting shortages now that Kaiser's Fontana plant is operating. Columbia Steel and Bethlehem Steel at Los Angeles are reported eating into their 60-day normal surplus. Chicago, usually accustomed to receiving heavy shipments from the West Coast, reports these as conspicuous by their absence.

An analysis of the scrap supply situation and the need for a scrap drive appears on page 102.

Cast scrap in many markets is nearly desperate. Demand has been very active and supply wholly inadequate in most areas. Partial blame for the shortage in this grade is credited to the disappearance of many small dealers. By the same token, the forthcoming scrap drive is expected to ferret out supplies of cast which would have normally flowed through these non-existant dealers. Salvage drive officials are said to anticipate 10 per cent of drive proceeds to be in cast grades thus giving at least temporary relief.

Little change is recorded this week in steelmaking grades with buying fairly brisk in attempts to build up inventories. Collections continue to be poor and preparation lags in many zones due to labor shortages. Three-way alloy solids and alloy scrap generally have been the subject of some complaints of slow movement. Some drop in industrial scrap is reported resulting from curtailed machine tool production.

•

BUFFALO—Scrap supply of steelmaking grades has taken a turn for the worse. The movement of material from local dealers has reached a low ebb and an anticipated influx of boat scrap has failed to materialize. Huge tonnages, however, are still hoped for from the Eastern Seaboard via the Barge Canal. Some dealers are reluctant to accept alloy material as supplies are accumulating due, according to dealers, to the small volume of allocations coming through.

•

CHICAGO—Isolated waves of optimism are breaking the calm surface of the current scrap drive insofar as cast grades are concerned. It is argued that disappearance of many small dealers during the past year has halted collection of stove and agricultural cast iron scrap, damming up a reserve susceptible to the drive, whereas industrial steel scrap has flowed unhampered through diverted channels. Famine is almost universal among cast customers. Mill inventories to the contrary range from satisfactory to slightly below average with few buyers quaking in fear of serious Winter shortages. Shipments of appreciable quantities of remote scrap to the Chicago district, a characteristic of some months ago, have halted entirely with buyers generally unwilling to pay higher prices involved. Battlefield scrap and shipyard material from the West Coast is conspicuous by its absence.

•

CINCINNATI—The district scrap market is unchanged from the condition that has obtained for the past several weeks. Cast iron grades are still very active in demand, but dealers are finding it increasingly difficult to supply it. In fact, in some instances, the dealers have had to send truckloads in order to supply emergencies. The three-way steel continues to be a headache and dealers can't move it under present price schedules.

•

BOSTON—With a sharp drop in production of shop scrap and a slump in the movement of shipyard scrap, the market is less active. The abrupt curtailment of machine tool production has accentuated the drop in shop scrap supplies. At a meeting of Providence yard interests it was decided $3.50 a ton delivered yard is a fair price for drive scrap.

•

BIRMINGHAM—Interest in scrap collections in this area as a part of the national drive is picking up after a slow start. Scrap campaign leaders here held back from pushing collection plans so that attention of the public would not be diverted from the Third War Loan drive.

•

PHILADELPHIA — Scrap situation here continues unchanged with most mills fairly well fixed as far as inventories are concerned. Turnings are still tight and alloy scrap is still piling up with no buyers. Although the scrap drive was scheduled to begin Oct. 1 there has been no sign of its getting underway.

•

NEW YORK—Brokers are waiting for the scrap drive to begin but expect very little publicity this year from newspapers. Dealers will work with city officials and will handle most scrap collected. There has been no other change in the district, the No. 1 problem continuing to be the disposal of alloy scrap.

•

PITTSBURGH—Supplies are still tight here, reflecting a dip into inventories by some consumers. Dealers' yards are still bare, and it is hoped that the coming scrap drive will replenish at least part of these diminished supplies.

•

CLEVELAND—Steel producers, especially those making electric furnace steels expect that the scrap supply situation will be extremely tight this Winter. With constantly increasing numbers of changes in war material production and curtailments of production programs, plus the fact that mills are taking closer crops on ingots and billets, scrap supplies are diminishing fast.

IRON AND STEEL (OTHER THAN RAILROAD) SCRAP

(All Prices Are Per Gross Ton)

	BASIC OPEN HEARTH GRADES		BLAST FURNACE GRADES				ELECTRIC FURNACE, ACID OPEN HEARTH AND FOUNDRY GRADES									
							Low Phos.		Heavy Structural and Plate			Foundry Steel				
	No. 1 & 2 Hvy. Melt. No. 1 Cp. Blk. Shts. No. 1 & 2 Bundles No. 1 Busheling	Unbaled* Machine Shop Turnings	Mixed Borings and Turnings	Cast Iron Borings	Shoveling Turnings	No. 2 Busheling	Billet, Bloom, Forge Crops	Bar Crops, Punchings Plate Scrap and Cast Steel	3 ft. and Under	2 ft. and Under	1 ft. and Under	2 ft. and Under	1 ft. and Under	Auto. Springs, and Crankshafts	Alloy Free Low Phos. and Sulphur Turnings	Heavy Axle and Forge Turn. First Cut	Electric Furnace Bundles
Pittsburgh, Brackenridge, Butler, Monessen, Midland, Johnstown, Sharon, Canton, Steubenville, Warren, Youngstown, Weirton	$20.00	$15.00	$15.00	16.00	$17.00	$17.50	$25.00	$22.50	$21.50	$22.00	$22.50	$21.50	$22.00	$21.00	$18.00	$19.50	$21.00
Cleveland, Middletown, Cincinnati, Portsmouth	19.50	14.50	14.50	15.50	16.50	17.00	24.50	22.00	21.00	21.50	22.00	21.00	21.50	20.50	17.50	19.00	20.50
Chicago, Claymont, Coatesville, Conshohocken, Harrisburg, Phoenixville, Sparrows Point	18.75	13.75	13.75	14.75	15.75	16.25	23.75	21.25	20.25	20.75	21.25	20.25	20.75	19.75	16.75	18.25	19.75
Ashland, Ky.	19.50	14.50	14.50	15.50	16.50	17.00	24.50	22.00	21.00	21.50	22.00	21.00	21.50	20.50	17.50	19.00	20.50
Buffalo, N. Y.	19.25	14.25	14.25	15.25	16.25	16.75	24.25	21.75	20.75	21.25	21.75	20.75	21.25	20.25	17.25	18.75	20.25
Bethlehem, Pa.; Kokomo, Ind.	18.25	13.25	13.25	14.25	15.25	15.75	23.25	20.75	19.75	20.25	20.75	19.75	20.25	19.25	16.25	17.75	19.25
Duluth, Minn.	18.00	13.00	13.00	14.00	15.00	15.50	23.00	20.50	19.50	20.00	20.50	19.50	20.00	19.00	16.00	17.50	19.00
Detroit, Mich.	17.85	12.85	12.85	13.85	14.85	15.35	22.85	20.35	19.35	19.85	20.35	19.35	19.85	18.85	15.85	17.35	18.85
Toledo, Ohio	.....	12.85	12.85	13.85	14.85	15.35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis, Mo.	17.50	12.50	12.50	13.50	14.50	15.00	22.50	20.00	19.00	19.50	20.00	19.00	19.50	18.50	15.50	17.00	18.50
Atlanta, Ga.; Alabama City, Ala.; Birmingham, Los Angeles; Pittsburg, Cal.; San Francisco	17.00	12.00	12.00	13.00	14.00	14.50	22.00	19.50	18.50	19.00	19.50	18.50	19.00	18.00	15.00	16.50	18.00
Minnequa, Colo.	16.50	11.50	11.50	12.50	13.50	14.00	21.50	19.00	18.00	18.50	19.00	18.00	18.50	17.50	14.50	16.00	17.50
Seattle, Wash.	14.50	9.50	9.50	10.50	11.50	12.00	19.50	17.00	16.00	16.50	17.00	16.00	16.00	15.00	12.50	14.00	15.50

*Baled turnings are $5 per gross ton higher.

BUNDLES: Tin can bundles are $4 below dealers' No. 2 bundles No. 3 bundles are $2 less than No. 1 heavy melting.

AT NEW YORK CITY or Brooklyn, the maximum shipping point price is $15.33 for No. 1 heavy melting, f.o.b. cars, f.a.s. vessel or loaded on truck. Minimum set at $14 per grosston at any shipping point in U. S. Other grades carry differentials similar to those in table. New Jersey prices must be computed on basis of all-rail. At Boston the maximum is $15.05 for No. 1 f.o.b. cars, f.a.s. vessel or loaded on trucks. Shipments from a New England shipping point to a consumer outside New England carry maximum transportation charge of $6.66 per ton.

SWITCHING CHARGES: Deductions for shipping points within basing points (cents per gross ton) are: Pittsburgh, Brackenridge, 55c.; Midland, Johnstown, Sharon, Youngstown, Warren, Weirton, Cleveland, Toledo, Los Angeles, San Francisco, 42c.; Butler, Monessen, Canton, Steubenville, Cincinnati*, Portsmouth, Ashland, Coatesville, Harrisburg, Phoenixville, Bethlehem, Kokomo, Duluth, St. Louis, 28c.; Buffalo, Claymont, 36c.; Conshohocken, 11c.; Atlanta, Birmingham, 32c.; Pittsburg, Cal., 42c.; Middletown, 14c.; Sparrow's Point, 11c.; Chicago, 84c.; Detroit, 53c.; Alabama City, 26c.; Minnequa, 22c.; Seattle, 38c. *At Cincinnati, for basic open hearth grades, foundry steel and auto springs and crankshafts, deduct 80c. per ton.

PITTSBURGH basing point includes switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport, Cincinnati basing point includes Newport, Ky., switching district. St. Louis includes switching districts of Granite City, East St. Louis, Madison, Ill. San Francisco includes switching districts of S. San Francisco, Niles and Oakmont, Cal. Claymont, Del., includes the switching point of Chester, Pa. Chicago includes Gary, Ind., switching district.

MAXIMUM SHIPPING POINT PRICE—Where shipment is by rail or vessel, or by combination of rail and vessel, the scrap is at its shipping point when placed f.o.b. railroad or f.a.s. vessel. In such cases, the maximum shipping point prices shall be: (a) For shipping points located within a basing point, the price listed in the table above for the scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap within the basing point and (b) for shipping points located outside the basing point, the price in table above at the most favorable basing point minus the lowest transportation charge by rail or water or combination thereof. In lieu of dock charge add 75c. a ton*, but 50c. if moved by deck scow or railroad lighter. Shipping by motor vehicle: The scrap is at its shipping point when loaded. For shipping points located within basing points take price listed in table minus applicable switching charge. If located outside a basing point, the price at the most favorable basing point minus lowest established charge for transporting by common carrier. If no established transportation rate exists, the customary costs are deducted. Published dock charges prevail. If unpublished include 75c.* For exceptions see official order.

UNPREPARED SCRAP: For unprepared scrap, maximum prices shall be $3.50 (and in the case of the material from which No. 1, No. 2, and No. 3 bundles are made $4) less maximum prices for the corresponding grade or grades of prepared scrap. In no case, however, shall electric furnace and foundry grades be used as the "corresponding grade or grades of prepared scrap." Converter may charge $2.50 per ton on consumer-owned unprepared remote scrap (see order). A preparation-in-transit charge for allocated unprepared scrap is provided.

NEW LISTED GRADES: Priced in dollars per gross ton less than No. 1 heavy melting steel. Pit scrap, ladle skulls, slag reclaim, etc., of 85% or more Fe priced—$2; 75 to 85% Fe—$4; under 75% Fe—$8 per ton. Mill scale of 65% or more Fe—$8 per ton. Mill cinder and grindings, shipping point maximum price of $4 per gross ton at all U. S. shipping points.

CHEMICAL BORINGS: No. 1 (new, clean, containing not more than 1 per cent oil), $1 less than No. 1 heavy melting; No. 2 (new, clean, containing not more than 1.5 per cent oil), $2 less than No. 1 heavy melting. If loaded in box cars add 75c.

*At Memphis 50c.; Great Lakes ports $1; New England $1.25.

RAILROAD SCRAP

	No. 1 RR Heavy Melting	Scrap Rails	Rails for Rerolling	Scrap Rails: 3 ft. and Under	Scrap Rails: 2 ft. and Under	Scrap Rails: 18 in. and Under
Cleveland, Cincinnati, Ashland, Portsmouth, Middletown	$20.50	$21.50	$23.00	$23.50	$23.75	$24.00
Canton, Pittsburgh, Sharon, Steubenville, Wheeling, Youngstown	21.00	22.00	23.50	24.00	24.25	24.50
Chicago, Philadelphia, Sparrows Pt., Wilmington	19.75	20.75	22.25	22.75	23.00	23.25
Birmingham, Los Angeles, San Francisco	18.00	19.00	20.50	21.00	21.25	21.50
Buffalo	20.25	21.25	22.75	23.25	23.50	23.75
Detroit	18.85	19.85	21.35	21.85	22.10	22.35
Duluth	19.00	20.00	21.50	22.00	22.25	22.50
Kansas City, Mo.	17.00	18.00	19.50	20.00	20.25	20.50
Kokomo, Ind.	19.25	20.25	21.75	22.25	22.50	22.75
Seattle	15.50	16.50	18.00	18.50	18.75	19.00
St. Louis	18.50	19.50	21.00	21.50	21.75	22.00

CAST IRON SCRAP

	Group A	Group B	Group C
No. 1 cupola cast	$18.00	$19.00	$20.00
Clean auto cast	18.00	19.00	20.00
Unstripped motor blocks	15.50	16.50	17.50
Stove Plate	17.00	18.00	19.00
Heavy Breakable Cast	15.50	16.50	17.50
Charging Box Size Cast	17.00	18.00	19.00
Misc. Malleable	20.00	21.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C: States not named in A and B; switching district of Kansas City, Kan., Mo.

Tool Steel Scrap Ceiling Prices Set by MPR 379, May 4, 1943

BASE PRICE SEGREGATED

	Solids, Lb. Cont. W	Turnings, Lb. Cont. W
Type 1	$1.80	$1.60
Type 2	1.60	1.40
Type 3	1.25	1.25
Type 4*	0.125	0.105
Type 5*	0.135	0.115

*Per lb. of scrap material.

BASE PRICE UNSEGREGATED SOLIDS

$1.50 per lb. contained W if 5% or more.

$1.15 per lb. contained W if over 1% and less than 5%.

$0.80 per lb. contained Mo if 1½% or more.

BASE PRICE UNSEGREGATED TURNINGS

$1.30 per lb. contained W if 5% or more.

$1.00 per lb. contained W if 1% and less than 5%.

$0.70 per lb. contained Mo if 1½% or more.

Comparison of Prices . . .

Advances Over Past Week in **Heavy Type**; Declines in *Italics*. [Prices Are F.O.B. Major Basing Points]

	Oct. 5, 1943	Sept. 28, 1943	Sept. 7, 1943	Oct. 6, 1942
Flat Rolled Steel: (Cents Per Lb.)				
Hot rolled sheets	2.10	2.10	2.10	2.10
Cold rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip	2.10	2.10	2.10	2.10
Cold rolled strip	2.80	2.80	2.80	2.80
Plates	2.10	2.10	2.10	2.10
Plates, wrought iron	3.80	3.80	3.80	3.80
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00
Tin and Terne Plate: (Dollars Per Base Box)				
Tin plate, standard cokes	$5.00	$5.00	$5.00	$5.00
Tin plate, electrolytic	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.30	4.30	4.30	4.30
Bars and Shapes: (Cents Per Lb.)				
Merchant bars	2.15	2.15	2.15	2.15
Cold finished bars	2.65	2.65	2.65	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00
Wrought iron bars	4.40	4.40	4.40	4.40
Wire and Wire Products: (Cents Per Lb.)				
Plain wire	2.60	2.60	2.60	2.60
Wire nails	2.55	2.55	2.55	2.55
Rails: (Dollars Per Gross Ton)				
Heavy rails	$40.00	$40.00	$40.00	$40.00
Light rails	40.00	40.00	40.00	40.00
Semi-Finished Steel: (Dollars Per Gross Ton)				
Rerolling billets	$34.00	$34.00	$34.00	$34.00
Sheet bars	34.00	34.00	34.00	34.00
Slabs	34.00	34.00	34.00	34.00
Forging billets	40.00	40.00	40.00	40.00
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00
Wire Rods and Skelp: (Cents Per Lb.)				
Wire rods	2.00	2.00	2.00	2.00
Skelp (grvd)	1.90	1.90	1.90	1.90

	Oct. 5, 1943	Sept. 28, 1943	Sept. 7, 1943	Oct. 6, 1942
Pig Iron: (Per Gross Ton)				
No. 2 fdy., Philadelphia	$25.84	$25.84	$25.89	$25.89
No. 2, Valley furnace	24.00	24.00	24.00	24.00
No. 2, Southern Cin'ti	24.68	24.68	24.68	24.68
No. 2, Birmingham	20.38	20.38	20.38	20.38
No. 2, foundry, Chicago†	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa.	25.39	25.39	25.39	25.39
Basic, Valley furnace	23.50	23.50	23.50	23.50
Malleable, Chicago†	24.00	24.00	24.00	24.00
Malleable, Valley	24.00	24.00	24.00	24.00
L. S. charcoal, Chicago	31.34	31.34	31.34	31.34
Ferromanganese‡	135.00	135.00	135.00	135.00
Scrap: (Per Gross Ton)				
Heavy melt'g steel, P'gh.	$20.00	$20.00	$20.00	$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.85	17.85	17.85	17.85
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 cast, Pittsburgh	20.00	20.00	20.00	20.00
No. 1 cast, Philadelphia	20.00	20.00	20.00	20.00
No. 1 cast, Ch'go	20.00	20.00	20.00	20.00
Coke, Connellsville: (Per Net Ton at Oven)				
Furnace coke, prompt	$6.50	$6.50	$6.50	$6.00
Foundry coke, prompt	7.50	7.375	6.875	6.875
Non-Ferrous Metals: (Cents per Lb. to Large Buyers)				
Copper, electro., Conn.	12.00	12.00	12.00	12.00
Copper, Lake, New York	12.00	12.00	12.00	12.00
Tin (Straits), New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	8.25	8.25	8.25	8.25
Lead, St. Louis	6.35	6.35	6.35	6.35
Aluminum, Virgin, del'd.	15.00	15.00	15.00	15.00
Nickel, electrolytic	35.00	35.00	35.00	35.00
Magnesium, ingot	20.50	20.50	20.50	22.50
Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.
‡For carlots at seaboard.

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 171-183.

Composite Prices . . .

	FINISHED STEEL	PIG IRON	SCRAP STEEL
Oct. 5, 1943	2.25513c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton
One week ago	2.25513c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton
One month ago	2.25513c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton
One year ago	2.26190c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton

	HIGH	LOW	HIGH	LOW	HIGH	LOW
1943	2.25513c.,	2.25513c.,	$23.61	$23.61	$19.17	$19.17
1942	2.26190c.,	2.26190c.,	23.61	23.61	19.17	19.17
1941	2.43078c.,	2.43078c.,	$23.61, Mar. 20	$23.45, Jan. 2	$22.00, Jan. 7	$19.17, Apr. 10
1940	2.30467c., Jan. 2	2.24107c., Apr. 16	23.45, Dec. 23	22.61, Jan. 2	21.83, Dec. 30	16.04, Apr. 9
1939	2.35367c., Jan. 3	2.26689c., May 16	22.61, Sept. 19	20.61, Sept. 12	22.50, Oct. 3	14.08, May 16
1938	2.58414c., Jan. 4	2.27207c., Oct. 18	23.25, June 21	19.61, July 6	15.00, Nov. 22	11.00, June 7
1937	2.58414c., Mar. 9	2.32263c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.67, June 9
1936	2.32263c., Dec. 28	2.05200c., Mar. 10	19.74, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.07642c., Oct. 1	2.06492c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 29
1934	2.15367c., Apr. 24	1.95757c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.95578c., Oct. 3	1.75836c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.89196c., July 5	1.83901c., Mar. 1	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.99626c., Jan. 13	1.86586c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.25488c., Jan. 7	1.97319c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.31773c., May 28	2.26498c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3

Weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 per cent of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

. . . Prices of Finished Iron and Steel

Steel prices shown here are f.o.b. basing points, in cents per lb, unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, mutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, reductions, and in most cases freight absorbed to meet competition. Delivered prices do not reflect new 3 per cent tax on freight rates.

Basing Point → / Product ↓	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio	Gulf Ports, Cars	Pacific Ports, Cars[10]	DELIVERED TO Detroit	New York	Philadelphia
SHEETS															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.20¢	2.34¢	2.27¢
Cold rolled[1]	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.74¢	3.67¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.45¢	3.71¢	3.67¢
Long ternes[2]	3.80¢		3.80¢									4.55¢		4.16¢	4.12¢
STRIP															
Hot rolled[3]	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢	2.46¢	
Cold rolled[4]	2.80¢	2.90¢		2.80¢			2.80¢	(Worcester = 3.00¢)					2.90¢	3.16¢	
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢							2.56¢	
Commodity C-R	2.95¢	3.05¢		2.95¢			2.95¢	(Worcester = 3.35¢)					3.05¢	3.31¢	
TIN MILL PRODUCTS															
Coke tin plate, base box	$5.00	$5.00	$5.00						$5.10					5.36¢	5.32¢
.50 } Electro tin plate, box	$4.50	$4.50	$4.50												
.75 } Electro tin plate, box	$4.65		$4.65												
Black plate, 29 gage[5]	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢[12]			3.37¢
Mfg. ternes, special box	$4.30	$4.30	$4.30						$4.40						
BARS															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢		(Duluth = 2.25¢)			2.50¢	2.80¢	2.25¢	2.49¢	2.47¢
Rail steel[6]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.50¢	2.80¢			
Reinforcing (billet)[7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢[13]	2.25¢	2.39¢	
Reinforcing (rail)[7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.50¢	2.55¢[13]	2.25¢		2.47¢
Cold finished[8]	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢			(Detroit = 2.70¢)					2.99¢	2.97¢
Alloy, hot rolled	2.70¢	2.70¢				2.70¢	(Bethlehem, Massillon, Canton = 2.70¢)						2.80¢		
Alloy, cold drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢							3.45¢		
PLATES								(Coatesville and Claymont = 2.10¢)							
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	2.35¢		2.45¢	2.65¢	2.31¢	2.29¢	2.15¢
Floor plates	3.35¢	3.35¢									3.70¢	4.00¢		3.71¢	3.67¢
Alloy	3.50¢	3.50¢			(Coatesville = 3.50¢)						3.95¢	4.15¢		3.70¢	3.59¢
SHAPES															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢		(Bethlehem = 2.10¢)			2.45¢	2.75¢		2.27¢	2.215¢
SPRING STEEL, C-R															
0.26 to 0.50 Carbon	2.80¢			2.80¢			(Worcester = 3.00¢)								
0.51 to 0.75 Carbon	4.30¢			4.30¢			(Worcester = 4.50¢)								
0.76 to 1.00 Carbon	6.15¢			6.15¢			(Worcester = 6.35¢)								
1.01 to 1.25 Carbon	8.35¢			8.35¢			(Worcester = 8.55¢)								
WIRE[9]															
Bright[14]	2.60¢	2.60¢		2.60¢	2.60¢		(Worcester = 2.70¢)					3.10¢			2.92¢
Galvanized	add proper size extra and galvanized extra to bright wire base, above.														
Spring (High Carbon)	3.20¢	3.20¢		3.20¢			(Worcester = 3.30¢)					3.70¢			3.52¢
PILING															
Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢			2.72¢

[1] Mill run sheets are 10c per 100 lb. less than base; and primes only, 25c. above base. [2] Unassorted 8-lb. coating. [3] Widths up to 12 in. [4] Carbon 0.25 per cent and less. [5] Applies to certain width and length limitations. [6] For merchant trade. [7] Prices for straight length material only, from a producer to a consumer. Functional discount of 25c. per 100 lb. to fabricators. [8] Also shafting. For quantities of 20,000 to 29,999 lb. [9] Carload lot to manufacturing trade. [10] These prices do not apply if the customary means of transportation (rail and water) are not used. [12] Boxed. [13] Portland and Seattle price, San Francisco price is 2.50c. [14] This bright wire base price to be used in figuring annealed and bright finish wires, commercial spring wire and galvanized wire.

GOVERNMENT CEILING—Price Schedule No. 6 issued April 16, 1941, governs steel mill prices; Price Schedule No. 49 governs warehouse prices which are on another page of this issue.

EXCEPTIONS TO PRICE SCHEDULE No. 6—On hot rolled carbon bars, Phoenix Iron Co. may quote 2.35c. at established basing points, Calumet Steel division of Borg Warner may quote 2.35c., Chicago, on bars from its 8-in. mill; Joslyn Mfg. Co. may quote 2.35c., Chicago base. On rail steel bars Sweets Steel Co. may quote 2.35c., f.o.b. mi'l. On hot rolled sheets, Andrews Steel Co. may quote for shipment to Detroit area on Middletown base; Parkersburg Iron & Steel may quote $2.25 per hundred f.o.b. Parkersburg, W. Va. On galvanized sheets, Andrews Steel may quote 3.75c., at established basing points; Parkersburg Iron & Steel may quote $3.85 per hundred f.o.b. Parkersburg, W. Va. On hot rolled strip, Joslyn Mfg. Co. may quote 2.30c., Chicago base. On plates, Granite City Steel Co. may quote 2.35c., f.o.b. mill, and Central Iron & Steel Co. may quote 2.20c., f.o.b. basing points. On shapes, Phoenix Iron Co. may quote 2.30c. established basing points and 2.50c. Phoenixville for export.

On rail steel merchant bars, Eckels-Nye Corp. may charge 2.40c. On tubing, South Chester Tube Co. may price Gulf or Pacific Coast all-rail shipments and shipments west of Harrisburg on basis of f.o.b. Chester. On lend-lease sales to eastern seaboard, Sheffield Steel Co. and Colorado Fuel & Iron Corp. may sell f.o.b. mill. SEMIFINISHED STEEL—Follansbee Steel Corp. may sell forging billets at $40.50 f.o.b. Toronto; Continental Steel Corp. may sell Acme Steel Co. at $34 for rerolling billets plus extras and freight; Ford Motor Co. may sell rerolling billets at $34 f.o.b. Dearborn; Andrews Steel Co. may sell forging billets at $50 at established basing points and slabs at $41; Empire Sheet and Tin Plate may sell slabs at $41 at established basing points and sheet bars at $39 f.o.b. mill; on lend-lease sales Northwestern Steel & Wire Co. may charge $41 per gross ton f.o.b. mill for rerolling billets; on lend-lease sales Wheeling Steel Corp. may charge $36 per ton for small billets, f.o.b. Portsmouth and $37 per ton for sheet bars f.o.b. Portsmouth; Laclede Steel Co. on semi-finished sales for lend-lease shipped to eastern seaboard may use Chicago basing point prices f.o.b. Alton and Madison, Ill. ALLOY STEEL BARS—Texas Steel Co. may use Chicago base f.o.b. Fort Worth.

WAREHOUSE PRICES

(Delivered Metropolitan areas, per 100 lb. These prices do not necessarily apply for dislocated tonnage shipments when the f.o.b. City prices are used in conformance with OPA Schedule 49)

Cities	SHEETS			STRIP		Plates ¼ in. and heavier	Structural Shapes	BARS		ALLOY BARS			
	Hot Rolled (10 gage)	Cold Rolled	Galvanized (24 gage)	Hot Rolled	Cold Rolled			Hot Rolled	Cold Finished	†† Hot Rolled, 2300	‡ Hot Rolled, 3100	†† Cold Drawn, 2300	‡ Cold Drawn, 3100
*Philadelphia	$3.518	$4.872[5]	$5.018	$3.922	$4.772	$3.605	$3.666	$3.822	$4.072	....	$7.118	....	....
*New York	3.590	4.613[2]	5.010	3.974[6]	4.774	3.768	3.758	3.853	4.103	6.008	7.158	7.303	8.453
*Boston	3.774	4.744	5.224	4.106	4.715	3.912	3.912	4.044	4.144	6.162	7.312	7.344	8.494
*Baltimore	3.394	4.852	4.894	3.902	4.752	3.594	3.759	3.802	4.052	....	....	....	....
*Norfolk	3.771	4.965	5.371	4.165	4.865	3.971	4.002	4.065	4.165	....	....	....	....
*Washington	3.596	4.641	5.196	4.041	4.741	3.796	3.930	3.941	4.041	....	....	....	....
*Chicago	3.25	4.20	5.23[4]	3.60	4.65[8]	3.55	3.55	3.50	3.75	5.75	6.90	6.85	8.00
*Milwaukee	3.387	4.337[2]	5.272[4]	3.737	4.787[8]	3.687	3.687	3.637	3.887	5.987	7.137	7.087	8.237
*Cleveland	3.35	4.40	4.877[4]	3.60	4.45	3.40	3.588	3.35	3.75	5.956	7.106	6.85	8.00
*Buffalo	3.35	4.40	4.75[4]	3.819	4.669	3.63	3.40	3.35	3.75	5.75	6.90	6.85	8.00
*Detroit	3.45	4.50	5.00[4]	3.70	5.909[8]	3.609	3.661	3.45	3.80	6.08	7.23	7.159	8.309
*Cincinnati	3.425	4.475[2]	4.825[1]	3.675	4.711	3.611	3.691	3.611	4.011	....	....	....	....
*St. Louis	3.397	4.247[2]	5.172[4]	3.747	4.931[8]	3.697	3.697	3.647	4.031	6.131	7.281	7.231	8.381
*Pittsburgh	3.35	4.40	4.75	3.60	4.45	3.40	3.40	3.35	3.75	5.75	7.15	6.85	8.25
*St. Paul	3.51	4.46	5.257[4]	3.86	4.35[8]	3.81[9]	3.81[9]	3.76[9]	4.361	6.09	7.24	7.561	8.711
*Omaha	3.865	5.443	5.608[4]	4.215	....	4.165	4.165	4.115	4.443	....	....	....	....
*Indianapolis	3.58	3.58	4.568	4.918	3.768	4.78	3.63	3.58	3.98	6.08	7.23	7.18	8.33
Birmingham	3.45[3]	....	4.75[1]	3.70[3]	....	3.55[3]	3.55[3]	3.50[3]	4.43	....	....	....	....
Memphis	3.85	4.66	5.25	4.10	....	3.95	3.95	3.90	4.31	....	....	....	....
New Orleans	3.95	4.95	5.25	4.20	....	3.90	3.90	4.10	4.60	....	....	....	....
Houston	3.75	5.43	5.25	4.30	....	5.25	5.25	3.75	4.50	....	....	....	....
†Los Angeles	4.95	7.15	5.95	4.90	....	4.90	4.60	4.35	5.70	9.55	8.55	10.55	9.55
†San Francisco	4.55	7.55	6.60	4.50	....	4.65	4.35	3.95	5.55	9.80	8.80	10.80	9.80
†Seattle	4.65[7]	6.63	5.70[7]	4.25	....	4.75	4.45	4.20	5.75	....	8.00	....	....

NATIONAL EMERGENCY (N. E.) STEELS

(Hot Rolled Mill Extras for Alloy Content)

Designation	CHEMICAL COMPOSITION LIMITS, PER CENT								Basic Open-Hearth		Electric Furnace	
	Carbon	Manganese	Phosphorus Max.	Sulphur Max.	Silicon	Chromium	Nickel	Molybdenum	Bars and Bar Strip	Billets, Blooms and Slabs	Bars and Bar Strip	Billets, Blooms and Slabs
NE 1330	.28/ .33	1.60/1.90	.040	.040	.20/ .35				.10c	$2.00	....	....
NE 1335	.33/ .38	1.60/1.90	.040	.040	.20/ .35				.10	2.00	....	....
NE 1340	.38/ .43	1.60/1.90	.040	.040	.20/ .35				.10	2.00	....	....
NE 1345	.43/ .48	1.60/1.90	.040	.040	.20/ .35				.10	2.00	....	....
NE 1350	.48/ .53	1.60/1.90	.040	.040	.20/ .35				.10	2.00	....	....
NE 8613	.12/ .17	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8615	.13/ .18	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8617	.15/ .20	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8620	.18/ .23	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8630	.28/ .33	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8635	.33/ .38	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8637	.35/ .40	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8640	.38/ .43	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8642	.40/ .45	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8645	.43/ .48	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8650	.48/ .53	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8720	.18/ .23	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.20/ .30	.80	16.00	1.30	26.00
NE 9255	.50/ .60	.70/ .95	.040	.040	1.80/2.20				.40	8.00	....	....
NE 9260	.55/ .65	.75/1.00	.040	.040	1.80/2.20				.40	8.00	....	....
NE 9261	.55/ .65	.75 /1.00	.040	.040	1.80/2.20	.10/ .25			.65	13.00	....	....
NE 9262	.55/ .65	.75/1.00	.040	.040	1.80/2.20	.25/ .40			.65	13.00	....	....
NE 9415	.13/ .18	.80/1.10	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.75	15.00	1.25	$25.00
NE 9420	.18/ .23	.80/1.10	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.75	15.00	1.25	25.00
NE 9422	.20/ .25	.80/1.10	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.75	15.00	1.25	25.00
NE 9425	.23/ .28	.80/1.10	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.75	15.00	1.25	25.00
NE 9430	.28/ .33	.90/1.20	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.75	15.00	1.25	25.00
NE 9435	.33/ .38	.90/1.20	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.75	15.00	1.25	25.00
NE 9437	.35/ .40	.90/1.20	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.75	15.00	1.25	25.00
NE 9440	.38/ .43	.90/1.20	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.75	15.00	1.25	25.00
NE 9442	.40/ .45	1.00/1.30	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.80	16.00	1.30	26.00
NE 9445	.43/ .48	1.00/1.30	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.80	16.00	1.30	26.00
NE 9450	.48/ .53	1.20/1.50	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.80	16.00	1.30	26.00
NE 9537*	.35/ .40	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9540*	.38/ .43	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9542*	.40/ .45	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9545*	.43/ .48	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9550*	.48/ .53	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9261	.55/ .65	.75/1.00	.040	.040	1.80/2.20	.10/ .25						
NE 9425	.23/ .28	.80/1.10	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15				
NE 9545	.43/ .48	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25				

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb.; galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over: Exceptions: [1] 500 to 1499 lb. [2] 400 to 1499 lb. [3] 400 to 3999 lb. [4] 450 to 1499 lb. [5] 1000 to 1999 lb. [6] 0 to 1999 lb. [7] 300 to 10,000 lb. [8] 2000 to 39,999 lb. [9] 400 to 14,999 lb. At Philadelphia galvanized sheets, 2500 more bundles; Boston, cold rolled and galvanized sheets, 450 to 3749. lb.; San Francisco, hot rolled sheets, 400 to 39,999 lb.; galvanized and cold rolled sheets, 750 to 4999 lb.; cold fin. bars, 0-299 lb.; hot rolled alloy bars, 0-4999 lb.; Seattle, cold finished bars, 1000 lb. and over, hot rolled alloy bars, 0-1999 lb.; Memphis, hot rolled sheets, 400 to 1999 lb., galvanized sheets, 150 and over; Los Angeles, hot rolled sheets, bars, plates, cold rolled sheets, 300 to 1999 lb.; galvanized sheets, 1 to 6 bundles; cold finished bars, 1 to 99 lbs.; SAE bars, 100 lb. Extras for size, quality, etc., apply on above quotations.

† Los Angeles, San Francisco and Seattle prices reflect special provisions of amendment No. 2 to OPA Price Schedule No. 49.

†† For zoned cities these grades have been revised to NE 8617-20.

‡ For zoned cities these grades have been revised to NE 9442-45 Ann'ld.

* Base delivered prices according to price zones established by Amendments to RPS 49 including the 3% transportation tax—not including the 6% freight increase of March 18, 1942, rescinded May 15, 1943.

***Recommended for large sections only. Note: The extras shown above are in addition to a base price of 2.70c. per 100 lb., on finished products and $54 per gross ton on semi-finished steel major basing points and are in cents per 100 lb. and dollars per gross ton in semi-finished. When acid open-hearth is specified and acceptable add to basic open hearth alloy differential 0.25c. per lb. for bars and bar strip, $5.00 per gross ton for billets, blooms and slabs. The ranges shown above are restricted to sizes 100 sq. in. or less or equivalent cross sectional area 18 in. wide or under with a max. individual piece weight of 7000 lb.**

PRICES

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are $2.00 higher; f.o.b. Duluth, billets only, $2.00 higher. Delivered prices do not reflect new per cent tax on freight rates.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00
Alloy steel: Pittsburgh, Chicago, Canton, Massillon, Buffalo, or Bethlehem, per gross ton	$54.00

Shell Steel

	Per Gross Ton
3 in. to 12 in.	$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00

Basic open hearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham. Prices delivered Detroit are $2.00 higher.

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods

(No. 5 to 9/32 in.)

	Per Lb.
Pittsburgh, Chicago, Cleveland	2.00c.
Worcester, Mass.	2.10c.
Birmingham	2.00c.
San Francisco	2.50c.
Galveston	2.25c.

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse)

	Base per lb.
High speed	67c.
Straight molybdenum	54c.
Tungsten-molybdenum	57½c.
High-carbon-chromium	43c.
Oil hardening	24c.
Special carbon	22c.
Extra carbon	18c.
Regular carbon	14c.

Warehouse prices east of Mississippi are 2c. a lb. higher; west of Mississippi 3c. higher.

CORROSION AND HEAT-RESISTING STEEL

(Per lb. base price, f.o.b. Pittsburgh)

Chromium-Nickel Alloys

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

Straight-Chromium Alloys

	No. 410	No. 430	No. 442	No. 446
F.Billets	15.725c.	16.15c.	19.125c.	23.375c.
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
Hot strip	17.00c.	17.50c.	24.00c.	35.00c.
Cold strip	22.00c.	22.50c.	32.00c.	52.00c.

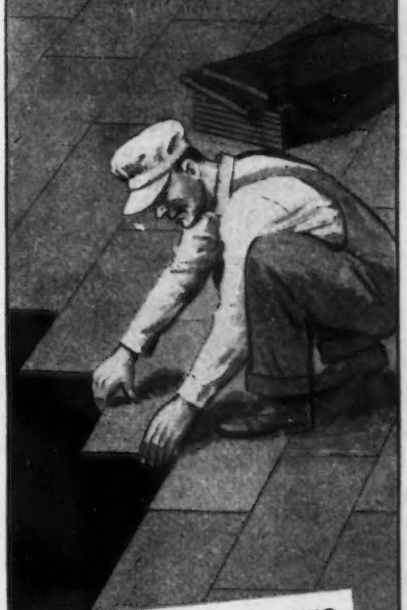
Chromium-Nickel Clad Steel (20%)

	No. 304
Plates	18.00c.*
Sheets	19.00c.

*Includes annealing and pickling.

New Floors Overnight

COVER OLD FLOORS WITH Carey Elastite INDUSTRIAL FLOORING



QUICKLY applied over any firm sub-base of concrete, wood or steel, (without interruption to plant operations) this *heavy duty* flooring is ready for use immediately.

Speeds Work—Holds Up Under Heavy Loads

Carey Elastite Industrial Flooring is smooth and resilient, permitting loads to be moved easily and with less man-power. Non-skid, it reduces accidents and breakage.

Comfortable underfoot, practically noiseless — resistant to fire and dampness.

Don't take costly chances . . . solve your flooring problems with Carey Elastite. Write Dept. 26.

CAREY ELASTITE FLOORING

½ INCH THICK

OTHER ASPHALT FLOORINGS

⅛", 3/16" and ¼"

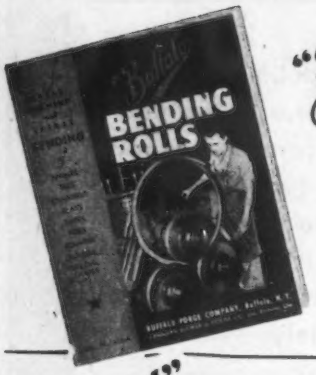
Do not confuse Carey Elastite Flooring with the thinner, decorative types of asphalt tile. This Carey Product is ½ inch thick and provides a tough, hard-wearing surface that will take a heavy traffic beating, year after year.

Sizes: ½"x12"x24" and ½"x12"x12"
Colors: Black and Mahogany Red

THE PHILIP CAREY MFG. COMPANY

Dependable Products Since 1873 • Lockland, Cincinnati, Ohio

These books bring the QUICK FACTS on improved metal fabricating equipment



"Buffalo" BENDING ROLLS

Complete illustrated catalog contains handy engineering data on the full line of Buffalo Bending Rolls for fast, accurate precision bending of all types of circular stock and with practically any kind of stock. A valuable bulletin to add to your data file. Ask for Bulletin 352-A.

"Buffalo" UNIVERSAL IRON WORKER

These up-to-the-minute machines offer practical short-cuts to a wide variety of metal working jobs. Provide a swift accurate method for punching, shearing, slitting, coping and notching of angle, tees, rounds, squares and flat metal. Full details in Bulletin 360.

"Buffalo" BILLET SHEARS

Powerful, positive action Buffalo Billet Shears are designed for fast production in the cutting of forging stock of every size and type. Easy to control, economical to operate. Several models, described in Bulletin 3295. Your free copy is waiting. Write:

ARMY E NAVY

BUFFALO FORGE COMPANY

492 Broadway — Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

★ "Buffalo" METAL WORKING MACHINES ★

PRICES

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts:

	Per Cent Off List
½ in. & smaller x 6 in. & shorter	65½
9/16 & ⅝ in. x 6 in. & shorter	63½
¾ to 1 in. x 6 in. & shorter	61
1⅛ in. and larger, all length	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

Nuts, Cold Punched or Hot Pressed:

(Hexagon or Square)

½ in. and smaller	62
9/16 to 1 in. inclusive	59
1⅛ to 1½ in. inclusive	57
1⅝ in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts	U.S.S.	S.A.E.
7/16 in. and smaller	..	64
½ in. and smaller	62	..
½ in. through 1 in.	..	60
9/16 to 1 in.	59	..
1⅛ in. through 1½ in.	57	58
1⅝ in. and larger	56	..

In full container lots, 10 per cent additional discount.

Stove Bolts

Packages, nuts loose	71 and 10
In packages, with nuts attached	71
In bulk	80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York on lots of 200 lb. or over.

Large Rivets *(½ in. and larger)*

Base per 100 lb.

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham $3.75

Small Rivets *(7/16 in. and smaller)*

Per Cent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham ..... 65 and 5

Cap and Set Screws

Per Cent Off List

Upset full fin. hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	6
Upset set screws, cup and oval points	7
Milled studs	4
Flat head cap screws, listed sizes	3
Filister head cap, listed sizes	6

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb., No. 1 O.H., gross ton	$40.00
Angle bars, 100 lb.	2.70
(F.o.b. Basing Points)	*Per Gross Ton*
Light rails (from billets)	$40.00
Light rails (from rail steel)	39.00
	Base per Lb.
Cut spikes	3.00c.
Screw spikes	5.15c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast	2.30c.
Track bolts	4.75c.
Track bolts, heat treated, to railroads	5.00c.
Track bolts, jobbers discount	63-5

Basing points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh, 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	$6.00	$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00

PRICES

ELECTRICAL SHEETS

(Base, f.o.b. Pittsburgh)

	Per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

F.o.b. Granite City, add 10c. per 100 lb. on field grade to and including dynamo. Pacific ports add 75c. per 100 lb. on all grades.

WIRE PRODUCTS

To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham

	Base per Keg
Standard wire nails	$2.55
Coated nails	2.55
Cutnails, carloads	3.85
	Base per 100 Lb.
Annealed fence wire	$3.05
Annealed galvanized fence wire	3.40
	Base Column
Woven wire fence*	67
Fence posts (carloads)	69
Single loop bale ties	59
Galvanized barbed wire†	70
Twisted barbless wire	70

*15½ gage and heavier. †On 80-rod spools in carload quantities.

WELDED PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills
(F.o.b. Pittsburgh only on wrought pipe)
Base Price—$200 per Net Ton

	Black	*Galv.*
Steel (Butt Weld)		
⅛ in.	63½	51
¼ in.	66½	55
⅜ to 3 in.	68½	57½
Wrought Iron (Butt Weld)		
⅛ in.	25	3½
¼ in.	30	10
⅜ and 1¼ in.	34	16
1½ in.	38	18½
2 in.	37½	18
Steel (Lap Weld)		
2 in.	61	49½
2½ and 3 in.	64	52½
3½ to 6 in.	66	54½
Wrought Iron (Lap Weld)		
2 in.	30½	12
2½ to 3½ in.	31½	14½
4 in.	33½	18
4½ to 8 in.	32½	17
Steel (Butt, extra strong, plain ends)		
	Black	*Galv.*
⅛ in.	61½	50½
¼ in.	65½	54½
⅜ to 3 in.	67	57
Wrought Iron (Same as Above)		
⅛ in.	25	6
¼ in.	31	12
⅜ to 2 in.	38	19½
Steel (Lap, extra strong, plain ends)		
2 in.	59	48½
2½ and 3 in.	63	52½
3½ to 6 in.	66½	56
Wrought Iron (Same as Above)		
2 in.	33½	15½
2½ to 4 in.	39	22½
4½ to 6 in.	37½	21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card. F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher on all butt weld.

"So solly—— hon. fifth columnist commit hara-kiri"

Foreign matter that must be eliminated prior to finishing operations *is* a fifth columnist, a saboteur of our war effort.

Wyandotte Metal Cleaners spell in powder and liquid form, a new kind of hara-kiri, or elimination, for grease, oil and film. With a product compounded to meet every challenge of metal cleaning and degreasing, Wyandotte may well be prepared to supply your most exacting needs.

There is a specialized Wyandotte cleaner for every metal cleaning problem, and for use in all types of equipment. Wyandotte's cleaning role, especially in armaments and airplane parts manufacturing, is a *vital* one today.

Why not call in your nearest Wyandotte Representative? His skill and experience, time and advice, are *yours* to command.

Wyandotte

SERVICE REPRESENTATIVES IN 88 CITIES

WYANDOTTE CHEMICALS CORPORATION
J. B. FORD DIVISION
WYANDOTTE, MICHIGAN

Wyandotte Chemicals Corporation consolidates the resources and facilities of Michigan Alkali Company and The J. B. Ford Company to better serve the nation's war and post-war needs.

PIG IRON

All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices (in italics) are delivered quotations per gross ton computed on the basis of the official maxima. Delivered prices do not reflect 3 per cent tax on freight rates.

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phosphorus	Charcoal
Boston††	*$25.50*	*$25.00*	*$26.50*	*$25.50*	.....	.....
Brooklyn	*27.50*	.....	.....	*28.00*	.....	.....
Jersey City	*26.53*	*26.03*	*27.53*	*27.03*	.....	.....
Philadelphia	*25.84*	*25.34*	*26.84*	*26.34*	*$30.74*	.....
Bethlehem, Pa.	25.00	24.50	26.00	25.50	.....	.....
Everett, Mass.††	25.00	24.50	26.00	25.50	.....	.....
Swedeland, Pa.	25.00	24.50	26.00	25.50	.....	.....
Steelton, Pa.	.....	24.50	.....	.....	29.50	.....
Birdsboro, Pa.	25.00	24.50	26.00	25.50	29.50	.....
Sparrows Point, Md.	25.00	24.50	.....	.....	.....	.....
Erie, Pa.	24.00	23.50	25.00	24.50	.....	.....
Neville Island, Pa.	24.00	23.50	24.50	24.00	.....	.....
Sharpsville, Pa.*	24.00	23.50	24.50	24.00	.....	.....
Buffalo	24.00	23.00	25.00	24.50	29.50	.....
Cincinnati, Ohio	*23.94*	*23.94*	.....	*25.11*	.....	.....
Canton, Ohio	*25.39*	*24.89*	*25.89*	*25.39*	*32.69*	.....
Mansfield, Ohio	*25.94*	*25.44*	*26.44*	*25.94*	*32.86*	.....
St. Louis	*24.50*	*24.50*	.....	.....	.....	.....
Chicago	24.00	23.50	24.50	24.00	*35.46*	*$31.34*
Granite City, Ill.	24.00	23.50	24.50	24.00	.....	.....
Cleveland	24.00	23.50	24.50	24.00	*32.42*	.....
Hamilton, Ohio	24.00	23.50	.....	24.00	.....	.....
Toledo	24.00	23.50	24.50	24.00	.....	.....
Youngstown*	24.00	23.50	24.50	24.00	*32.42*	.....
Detroit	24.00	23.50	24.50	24.00	.....	.....
Lake Superior fc.	.....	.....	.....	.....	.....	$34.00
Lyles, Tenn. fc.†	.....	.....	.....	.....	.....	33.00
St. Paul	*26.76*	.....	*27.26*	*26.76*	*39.80*	.....
Duluth	24.50	24.00	25.00	24.50	.....	.....
Birmingham	20.38	19.00	25.00	.....	.....	.....
Los Angeles	*26.95*	.....	.....	.....	.....	.....
San Francisco	*26.95*	.....	.....	.....	.....	.....
Seattle	*26.95*	.....	.....	.....	.....	.....
Provo, Utah	22.00	21.50	.....	.....	.....	.....
Montreal	*27.50*	*27.50*	.....	*28.00*	.....	.....
Toronto	*25.50*	*25.50*	.....	*26.00*	.....	.....

GRAY FORGE IRON: Valley or Pittsburgh furnace $23.50

*Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

**Pittsburgh Ferromanganese Co. (Chester furnace only) may charge $2.25 a ton over maximum basing point prices.

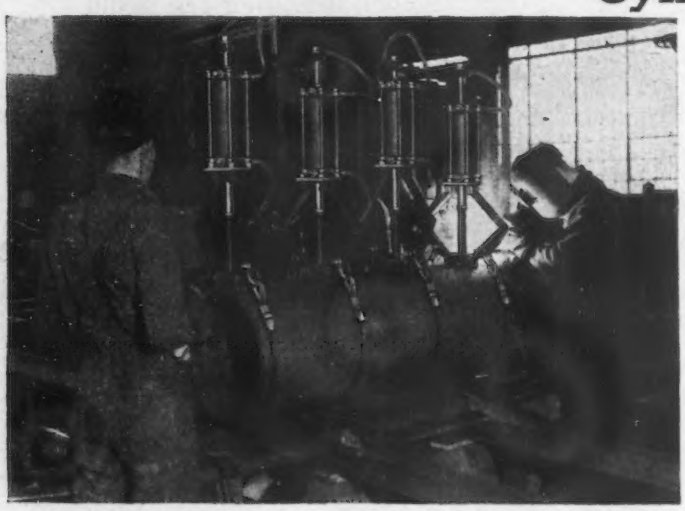
†Price shown is for low-phosphorous iron; high-phosphorous sells for $28.50 at the furnace.

††Eastern Gas & Fuel Associates, Boston, is permitted to sell pig iron produced by its selling company, Mystic Iron Works, Everett, Mass., at $2 per gross ton above maximum prices.

Delta Chemical & Iron Co., Chicago, may charge $30 for charcoal iron at its Delta, Mich., furnace.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade which is 1.75 per cent to 2.25 per cent); phosphorous differentials, a reduction of 38c. per ton for phosphorous content of 0.70 per cent and over; manganese differentials, a charge not to exceed 50c. per ton for each 0.50 per cent manganese content in excess of 1.00 per cent. Effective March 3, 1943, $2 per ton extra may be charged for 0.5 to 0.75 per cent nickel content and $1 per ton extra for each additional 0.25 per cent nickel.

HANNIFIN *Pneumatic Cylinders*



Air operated clamping fixture speeds welding of bomb bodies

Hannifin cylinders are used in this simple and effective fixture to hold rolled cylinders in place for tack welding. A touch of the control valve closes the butt joint of the cylindrical bomb body and holds the piece in place while tack welds are applied.

This is but one example of many applications where Hannifin precision cylinder construction provides high efficiency operation. Hannifin pneumatic cylinders are bored and honed to provide a straight, round, mirror-finished cylinder interior. Superior piston fit, maximum power and long-lasting efficient operation are assured. Write for Bulletin No. 57 with complete data.

HANNIFIN MANUFACTURING COMPANY
621-631 South Kolmar Avenue • Chicago 24, Illinois

Metal Powders

Prices are based on current market prices of ingots plus a fixed figure. For ton lots f.o.b. shipping point, in cents per lb.

Copper, electrolytic, 150 and 200 mesh	21⅛ to 23⅛
Copper, reduced, 150 and 200 mesh	20½ to 25½
Iron, commercial, 100 and 200 mesh	13½ to 18
Iron, crushed, 200 mesh and finer	6
Iron, hydrogen reduced, 300 mesh and finer	65
Iron, electrolytic, unannealed, coarser than 300 mesh	30 to 32
Iron, electrolytic, annealed minus 100 mesh	45
Iron, carbonyl, 300 mesh and finer	90
Aluminum, 100 and 200 mesh.	*23 to 27
Antimony, 100 mesh	20.0
Cadmium, 100 mesh	95
Chromium, 150 mesh	$1.10
Lead, 100, 200 & 300 mesh,	11½ to 12½
Manganese, 150 mesh	81
Nickel, 150 mesh	51½
Solder powder, 100 mesh,	8½c. plus metal
Tin, 100 mesh	58¾

*Freight allowed east of Mississippi.

BOILER TUBES

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes, Minimum Wall. Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots.

	Seamless Cold Drawn	Seamless Hot Rolled	Lap Weld Hot Rolled
2 in. o.d. 13 B.W.G.	15.03	13.04	12.3
2½ in. o.d. 12 B.W.G.	20.21	17.54	16.5
3 in. o.d. 12 B.W.G.	22.48	19.50	18.3
3½ in. o.d. 11 B.W.G.	28.37	24.62	23.1
4 in. o.d. 10 B.W.G.	35.20	30.54	28.6

(Extras for less carload quantities)

40,000 lb. or ft., and over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

PRICES

CAST IRON WATER PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	$54.80
6-in. and larger, del'd New York	52.20
6-in. and larger, Birmingham	46.00
6-in. and larger f.o.b. cars, San Francisco or Los Angeles	69.40
6-in. and larger f.o.b. cars, Seattle	71.20

Class "A" and gas pipe, $3 extra; 4-in. pipe is $3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger is $45 at Birmingham and $53.80 delivered Chicago, $59.40 at San Francisco and Los Angeles, and $70.20 at Seattle. Delivered prices do not reflect new 3 per cent tax on freight rates.

LAKE SUPERIOR ORES

(51.50% *Fe, Natural Content, Delivered Lower Lake Ports**)

	Per Gross Ton
Old range, bessemer, 51.50	$4.75
Old range, non-bessemer, 51.50	4.60
Mesaba, bessemer, 51.50	4.60
Mesaba, non-bessemer, 51.50	4.15
High phosphorus, 51.50	4.35

*Adjustments are made to indicate prices based on variance of Fe content of ores as analyzed on a dry basis by independent laboratories.

COKE

Furnace	*Per Net Ton*
†Connellsville, prompt	$6.50*
Foundry	
†Connellsville, prompt	7.50
Fayette County, W. Va. (Beehive)	8.10
By-product, Chicago	12.25
By-product, New England	13.75
By-product, Newark	12.40 to 12.95
By-product, Philadelphia	12.38
By-product, Cleveland	12.30
By-product, Cincinnati	11.75
By-product, Birmingham	8.50†
By-product, St. Louis	12.02
By-product, Buffalo	12.50

Maximum by-product coke prices established by OPA became effective Oct. 1, 1941.

*Hand-drawn ovens using trucked coal are permitted to charge $7.00 per net ton, plus usual transportation. Maximum beehive furnace coke prices established by OPA, Feb. 8, 1942. †F.o.b. oven.

FLUORSPAR

Pursuant to OPA Revised Maximum Price Regulation No. 126, effective July 1, 1943, to **Aug. 29, 1943,** base price per short ton is set at $33 for 70 per cent or more effective CaF_2 content; $32 for 65 but less than 70 per cent; $31 for 60 but less than 65 per cent; and $30 for less than 60 per cent. F.o.b. consumer's plant (1) plus either railroad freight on such shipment from the producer's shipping point to the consumer's plant, or (2) railroad freight on such a shipment from Rosiclaire, Ill., to the consumer's plant, which ever is lower. On and after Aug. 30, 1943, the maximum price f.o.b. a consumer's plant on any shipment of metallurgical grade fluorspar shall be $30 per short ton. Over $30 may be charged provided the producer receives specific instructions from the Steel Division of WPB to the effect that a specific consumer must have one of the higher grades, as provided in Section No. 4 (b).

REFRACTORIES

(*F.o.b. Works*)

Fire Clay Brick	*Per 1000*
Super-duty brick, St. Louis	$64.60
First quality, Pa., Md., Ky., Mo., Ill.	51.30
First quality, New Jersey	56.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	46.55
Second quality, New Jersey	51.00
No. 1, Ohio	43.00
Ground fire clay, net ton	7.60
Silica Brick	
Pennsylvania and Birmingham	$51.30
Chicago District	58.90
Silica cement, net ton (Eastern)	9.00
Chrome Brick	*Per Net Ton*
Standard, chemically bonded, Balt., Plymouth Meeting, Chester	$54.00
Magnesite Brick	
Standard, Balt. and Chester	$76.00
Chemically bonded, Baltimore	65.00
Grain Magnesite	
Domestic, f.o.b. Balt. and Chester in sacks (carloads)	$44.00
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.00

OK on arrival—
CLEVELAND QUALITY CAP SCREWS

Improved sturdy cartons—easy-to-read labels. Wood or corrugated cases, steel bound. "OK on arrival" assured.

Cleveland Cap Screws
Set Screws and Special Upset Parts

WAREHOUSES
CHICAGO: 726 W. Washington Blvd.
PHILADELPHIA . . 12th & Olive Sts.
NEW YORK. . . . . 47 Murray St.
LOS ANGELES . . . 1015 E. 16th St.

Made by the Originators of the Kaufman Process for Greater Strength and Accuracy
Specialists for 26 years in Headed and Threaded Products

WHAT CONTINENTAL STEEL IS DOING BETTER FOR WAR TODAY..IT WILL DO BETTER FOR YOU TOMORROW

Just now our long and specialized peacetime experience is supplying steels to meet the new and exacting demands of war. War experience, in turn, will enable Continental to furnish you still finer steel sheets and wire when peace and normal business returns.

CONTINENTAL STEEL CORP., Kokomo, Indiana
The Superior Sheet Steel Co., Canton, Ohio — a subsidiary

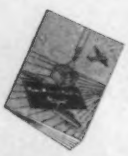
CONTINENTAL SUPERIOR STEEL

CONTINENTAL
STEEL CORPORATION

PRODUCERS OF—SHEETS: Black, Galvanized, Copperior, Hot and Cold Rolled, Special Coated, Long Terne, etc. WIRE: Bright Basic, Annealed, KONIK, Coppered, Tinned, Special Manufacturer's, etc.

How to get any of

144 Different Electric Hoists in One!



This booklet gives you details of the Reading Unit Construction Plan for special hoist equipment at standard equipment cost.

• With the Reading Unit Construction Plan, all electric hoists are composed of four interchangeable units: 1. Suspension Unit; 2. Hoisting Unit; 3. Motor Unit and 4. Control Unit. Combining these *standard* units in various ways gives 144 different hoists—each designed to do a specific job, and each purchased at standard equipment cost.

• A note on your company letterhead will bring you a copy of MODERN MATERIALS HANDLING MAGIC to show you just how the Reading Unit Construction Plan works.

Reading Chain & Block Corporation, 2101 Adams St., Reading, Pa.

READING CHAIN HOISTS·ELECTRIC HOISTS OVERHEAD TRAVELING CRANES

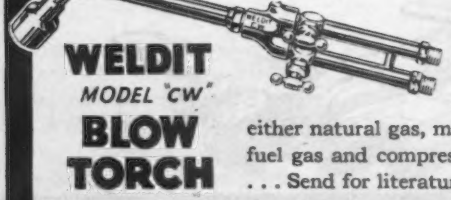
Safe Welding

AT LOWER PRODUCTION COSTS

The Weldit Gasaver shuts off the welding flame when not in use. . . . Conserves essential materials by cutting oxygen and acetylene consumption as much as *fifty* per cent. Prevents injury to workmen—or sudden fires—from dangerous idle torch flames. . . . Adjustment remains unaltered between welds.

When the Weldit Gasaver has been installed, you simply hang idle torch on the handy lever rod. Weight of torch pulls rod down, thus automatically shutting off supply lines. Relight instantly by passing torch over Gasaver pilot light. No bother. . . . No time lost. . . . *No readjusting required.* . . . Price $10.00 at Detroit. Order today.

Better Soldering, Annealing and Heating Jobs



The Weldit Model CW Blowpipe is in daily use by many foremost industrial plants. . . . Built in accordance with the recommendations of leading fabricators of sheet metal products. . . . Operates on either natural gas, manufactured gas, or other low temperature fuel gas and compressed air. Stands up under rough shop use. . . . Send for literature.

WELDIT ACETYLENE CO.
641 BAGLEY AVENUE • DETROIT 26, MICH.

PRICES

Ferromanganese

78-82% manganese, maximum contract base price per gross ton, lump size, f.o.b. car at Baltimore, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn. Carload lots (bulk) $135.00
Ton lots (packed) 141.00
Less ton lots (packed) 148.50
Premium, $1.70 for each 1% above 82% Mn; penalty, $1.70 for each 1% below 78%.

Electrolytic Manganese

99.9% manganese, maximum base contract price per lb. of metal, bulk, f.o.b. shipping point, with freight allowed to destination. Size, 1" x D.

	Eastern Zone	Central Zone	Western Zone
Carload lots	37.60c.	37.85c.	38.15c.
l.c.l. lots ..	39.60c.	38.60c.	40.65c.

Spiegeleisen

Maximum base contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 1% max. Si	19-21% Mn 1% max. Si	26-28% Mn 1% max. Si
Carloads	$35.00	$36.00	$49.50
Less ton*	47.50	48.50	62.00

Electric Ferrosilicon

OPA maximum base price cents per lb. contained Si, lump size in carlots, f.o.b. shipping point with freight allowed to destination.

	Eastern Zone	Central Zone	Western Zone
50% silicon ...	6.65c.	7.10c.	7.25c.
75% silicon ...	8.05c.	8.20c.	8.75c.

Spot sales 45c. per lb. higher for 50% Si; 30c. for 75% Si. For extras and premiums see MPR 405.

Silvery Iron

(*Per Gross Ton, base 6.00 to 6.50 Si*)
F.o.b. Jackson, Ohio $29.50
Buffalo 30.75

For each additional 0.50% silicon add $1 a ton. For each 0.50% manganese over 1% add 50c. a ton. Add $1 a ton for 0.75% phosphorus or over.

*Official OPA price established June 24, 1941.

Bessemer Ferrosilicon

Prices are $1 a ton above silvery iron quotations of **comparable** analysis.

Silicon Metal

OPA maximum base price per lb. of contained Si, lump size, f.o.b. shipping point with freight allowed to destination for l.c.l. above 2000 lb., packed.

	Eastern Zone	Central Zone	Western Zone
96% Si, 2% Fe.	13.10c.	13.55c.	16.50c.
97% Si, 1% Fe.	13.45c.	13.90c.	16.85c.

Ferrosilicon Briquets

OPA maximum base price per lb. of briquet, bulk, f.o.b. shipping point with freight allowed to destination. Approximately 40% silicon.

	Eastern Zone	Central Zone	Western Zone
Car lots ...	3.35c.	3.50c.	3.65c.

Spot prices ¼c. higher per lb. of briquet. For premiums and extras see MPR 405.

Silicomanganese

(*Per gross ton, delivered, carloads, bulk*)
3.00 carbon $120.00*
2.50 carbon 125.00*
2.00 carbon 130.00*
1.00 carbon 140.00*
Briquets, contract, basis carlots, bulk freight allowed, per lb... 5.80c.
Packed ..... 6.05c.
Less ton lots ..... 6.55c.†

*Spot prices are $5 per ton higher.
†Spot prices ¼c. higher.

Ferrochrome

(65-72% *Cr, 2% max. Si*)

OPA maximum base contract prices per lb. of contained Cr, lump size in carlots, f.o.b. shipping point, freight allowed to destination.

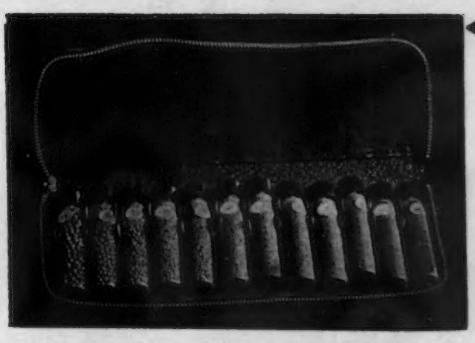
	Eastern Zone	Central Zone	Western Zone
0.03% carbon ..	25.00c.	25.40c.	26.00c.
0.06% carbon ..	23.00c.	23.40c.	24.00c.
0.10% carbon ..	22.50c.	22.90c.	23.50c.
1.00% carbon ..	20.50c.	20.90c.	21.50c.
2.00% carbon ..	19.50c.	19.90c.	20.50c.

Spot prices are ¼c. higher per lb. contained Cr. For extras and premiums see MPR 407.

PRICES

Other Ferroalloys

Ferrotungsten, delivered, carlots, per lb. contained tungsten	$1.90
Tungsten metal powder, 98%-99%, any quantity, per lb.	$2.60
Ferrovanadium, 35%-40%, contract basis, f.o.b. producers plant, usual freight allowances, open-hearth grade, per lb. contained vanadium	$2.70
Special grade	$2.80
Very special grade	$2.90
Vanadium pentoxide, 88%-92% V_2O_5 technical grade, contract basis, any quantity, per lb. contained V_2O_5	$1.10
Ferroboron, contract basis, 17.50% boron minimum, f.o.b. Niagara Falls, carlots, per lb. alloy	$1.20
Ton lots	$1.25
Silcaz No. 3, contract basis, f.o.b. Niagara Falls, all quantities, per lb. of alloy	23c.
Silvaz No. 3, contract basis, f.o.b. Niagara Falls, all quantities, per lb. of alloy	40c.
Grainal, f.o.b. Bridgeville, Pa., freight allowed 100 lb. and over, maximum based on rate to St. Louis, per lb.	45c.
Bortam, f.o.b. Niagara Falls	
Ton lots, per lb.	45c.
Less ton lots, per lb.	50c.
Borosil, 3% to 4% boron, 40 to 45% silicon, f.o.b. Philo, Ohio, per lb. contained boron	$7.00
Ferrocolumbium, 50% to 60%, f.o.b. Niagara Falls, ton lots, per lb. contained columbium	$2.25
Less ton lots	$2.30
Ferrotitanium, 40%-45%, f.o.b. Niagara Falls, N. Y., ton lots, per lb. contained titanium	$1.2[illegible]
Less ton lots	$1.25
Ferrotitanium, 20%-25%, 0.10 C max., ton lots, per lb. contained titanium	$1.35
Less ton lots	$1.40
High-carbon ferrotitanium, 15%-20%, 6%-8% carbon, contract basis, f.o.b. Niagara Falls, N. Y., freight allowed East of Mississippi River, North of Baltimore and St. Louis, per gross ton	$142.50
3%-5% carbon	$157.50
Ferrophosphorus, 18% electric or blast furnace, f.o.b. Anniston, Ala., carlots, with $3 unitage freight equaled with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, electrolytic 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., $3 unitage freight equalized with Nashville, per gross ton	$75.00
Ferromolybdenum, 55-75 per cent, f.o.b. Langeloth and Washington, Pa., any quantity, per lb. contained molybdenum	95c.
Calcium molybdate, 40%-45%, contract basis, f.o.b. Langeloth and Washington, Pa., any quantity, per lb. contained molybdenum	80c.
Molybdenum oxide briquettes, 48%-52% Mo, f.o.b. Langeloth, Pa., per lb. contained Mo	80c.
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per lb. contained Mo	80c.
Molybdenum powder, 99%, in 200-lb. kegs, f.o.b. York, Pa., per lb.	$2.60
Under 100 lb.	$3.00
Zirconium, 35-40%, contract basis, carloads in bulk or package, per lb. of alloy	15c.
Less ton lots	16c.
Zirconium, 12-15%, contract basis, carlots, bulk, per gross ton	$102.50
Packed	$107.50
Less ton lots	$112.50
Alsifer (approx. 20% Al, 40% Si and 40% Fe), contract basis, f.o.b. Niagara Falls, per lb.	7.50c.
Ton lots	8c.
Simanal (approx. 20% Si, 20% Mn, 20% Al), contract basis, carlots, f.o.b. Phila., Ohio, per lb. ton lots	9.50c.
Less ton lots	10.50c.



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